
1
Come on!
Here we go!
2
Here we are
on the trail.
3
Trees trees
everywhere!
Chickarees
FAMILIAR BIRDS


1
Come on!
Here we go!
2
Here we are
on the trail.
3
Trees trees
everywhere!
MORE BIRDS
Chickaree
NATURE
FAMILIAR BIRDS
BIRDS


1
Come on!
Here we go!
2
Here we are
on the trail.
3
Trees trees
everywhere!
MORE BIRDS
Chicharee
FAMILIAR BIRDS
BIRDS


3
trees
everywhere!
4
Oh, look!
Signs
on the trees!
5
Leaves, leaves,
All around.
6
Look
what we found.
A turtle! A turtle!


3
s trees
everywhere!
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NATURE TRAILS FOR ELEMENTARY CHILDREN

by

Dale Franklin Keller

A thesis submitted to
the Faculty of
The Consolidated University of North Carolina
in partial fulfillment
of the requirements for the degree
Master of Arts in Education

Greensboro

1951

Approved by,

Franklin H. McNutt
Adviser

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CHAPTER I

INTRODUCTION

Direct, purposeful experiences represent reality itself. Dr. Edgar Dale, Professor of Education and Head of the Curriculum Division, Bureau of Educational Research, Ohio State University declares:

> It (direct, purposeful experience) is the rich full-bodied experience that is the bed rock of all education. It is the purposeful experience that is seen, handled, touched, felt, smelled. It is the unabridged version of life itself--tangible experience, which we commonly refer to as 'something we can get your fingers on', 'something you can sink your teeth into', etc. --------It is learning by direct participation with responsibility for the outcome.[1]

The nature trail offers direct participation for every child and is reality itself. No one in this type experience can escape the "wonders of nature."

Science activities should begin as soon as the child enters school, even in the pre-school and kindergarten period.[2] The natural curiosity of the child makes the nature trail activity a most useful instrument in the teaching of elementary science. A youngster knows few fears and superstitions. This "eager beaver" will explore a snake in the same manner as a cricket. The world is his and there is so much to see---so many questions to ask. The nature trail experience provides a thrill for every child. Often it is the first time he can let the rich loam run through his fingers; enjoy the good smell of the forest

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1. Dale, Edgar. Audio-Visual Methods in Teaching. New York The Dryden Press, 1946. p. 38.

2. The National Society for the Study of Education, The Forty-Sixth Yearbook. Chicago: The Chicago University Press, 1946. p. 41.

and earth; feel the leaves and bark of trees; taste the herbs and twigs; hear the songs of birds, chirps of crickets, chattering of squirrels and the tattle-tale brook; see the lowly mosses, ferns and lichens in their role of interdependence on the great oak, the squirrels' nest, a flash of red----the cardinal and the forest with its maze of flora and fauna so great the eyes cannot see. This multi-sensory experience will cause the child to have an appreciation for the beauties of nature and a deep reverence for the Master Designer of our natural world.

Significance of the Problem

The philosphy of teaching science in the elementary school is set forth in Science For The Elementary School, issued by the State Superintendent of Public Instruction, Raleigh, North Carolina as:

> An acceptable educational procedure is to start with the child's growth where he is. The first source of his content should be found in the realm of his daily life experiences. But once this experience is found there should be some progressive development, some connection in this with his past and applications of his present and future. Organization of his experiencing content in relation to his daily needs, in information or in proof experiments, is a form of provision for organized steps in learning.[3]

Through the guidance of a skillful teacher proper scientific attitudes may be initiated at this early stage.[4] Superstition will be eliminated with the understanding of the cause and effect relationship in nature. The habit of accurate observation and recording of data

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3. Wetherington, Julia. Science For The Elementary School. Raleigh, North Carolina: Superintendent of Public Instruction, 1941. p. 6.

4. MacCracken, Helen D. and Armstrong, Lois G. How and Why Science Series, A Teachers Manual and Science Handbook. Spencer, New York: L. W. Singer Company, 1947. p. 4.

will prevent snap judgments. Evaluation of one's observation and data with a willingness to change view points in the face of new evidence will be a desirable attitude. Our "Tom Sawyer" will observe his natural world and will record the "survival of fittest" scheme of nature. The nature trail will ever be a world of answers and new problems for the young scientist.

Statement of the Problem

The title of this study is Nature Trails for Elementary Children. The orderly development of the study requires adequate answers to the following questions:

1. What are the criteria for establishing nature trails for elementary children?

2. What are the steps for adequate preparation of teachers and students for nature trail work?

3. What are the necessary techniques to be used in guiding the trip?

4. What are some possible outgrowths of the nature trail experience?

The study is restricted to the elementary school--first through sixth grades. The flora and fauna of Guilford County, North Carolina, will be the center of interest with emphasis on the three seasons — fall, winter, and spring.

CHAPTER II

CRITERIA FOR A NATURE TRAIL FOR ELEMENTARY CHILDREN

Nature trails are living textbooks of natural history which appeal to all age groups. Various types of trails have sprung up in many camps and parks.

The nature trail should run through cleared spaces, wooded areas, swamps, and marshes. Streams or lakes should be present. The trail should not be over one mile in length and should end near its beginning without the walker having to retrace his steps.[1] However, ideal conditions are rarely found and standards must be adapted to a local situation containing the typical flora and fauna of a certain area.

The general rules for establishing a nature trail for parks and camps are as follows:

1. Keep the trail narrow. Paths should be wide enough to permit a group to walk single file. Wider paths tend to make a road.
2. Keep it natural. Don't collect or destroy anything on the trail.
3. Keep it woodsy. Office labels and baggage tags don't belong in nature.
4. Keep it simple. Don't attempt to say too much about too

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1. Price, Betty. Adventures in Nature. New York: National Recreation Association, 1939. p. 17.

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1. Price, Betty. Adventures in Nature. New York: National Recreation Association, 1939. p. 17.

many subjects. Give facts - whimsey will be misunderstood. Present some of the facts in a humorous view.

5. Keep it protected. Make it a sample of good conservation.

6. Keep it growing. Add to it and change it with the seasons.[2]

Inasmuch as the nature trails will be used by elementary children as a laboratory of natural sciences, an addition to the rules for establishing nature trails was necessary for a school project. Elementary teachers will not be as well prepared for this type work as an experienced naturalist in charge of the trails at camps and parks. The additional care of children will also take the attention of the teachers. Therefore, the trail should have as many conveniences as possible to help the teacher and her group to enjoy their explorations. With this in mind, criteria for such trails should be formulated. A committee of prominent educators and scientists was formed to determine standards for nature trails adapted to the specific needs of young children.[3] The committee formulated the following criteria for a nature trail suitable to the locality and the needs of the groups using it.

1. Accessibility

   a. The location must be far enough away from the metropolitan area to have all the flora and fauna in its natural habitat but within commuting distance of the classroom.

   b. All-weather roads are essential.

   c. The location must be easily found.

   d. A long term permission from the owner should be obtained.

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2. Hillcourt, William, Field Book of Nature Activities. New York: Putnam Sons, 1950. p. 17.

3. See Appendix A for details of the Criteria Committee.

2. Facilities

a. If the location is used often, toilets which meet the sanitation regulations of the local health department, must be provided.

b. Drinking water should be available. If a spring is used, it should be covered to prevent contamination. The water must be tested regularly.

c. A shelter will be helpful as a classroom, as storage for equipment, and for protection during inclement weather.

d. A well-supplied first aid cabinet and stretcher should be located at the shelter. Simple first aid instructions must be posted in or near the first aid cabinet.

e. Parking space must be adequnte and safe.

f. A picnic area with tables and provision for cooking is desirable.

g. Copies of reliable field books of birds, trees, flowers, insects, mushrooms, ferns, and rocks should be available at the shelter.

3. The Nature Trail

a. The trail should be made wide enough to allow the group to walk double file. At the points of interest (signs or numbers), there should be a space large enough for the entire group to stand around the teacher.

b. Since elementary teachers are not specialized naturalists, they and the children under their direction will need many additional signs on the trail.

c. Rest stations should be located at frequent intervals in

order to give the children an opportunity to observe and listen.

d. Typical flora and fauna of Piedmont North Carolina should be present.

e. Typical rock formations would be desirable.

f. A variety of plants must be adjacent to the path.

g. A brook with animal and plant life is highly desirable.

h. The trail should not be over one mile in length and should end in the vicinity of its beginning. The path should include cleared ground, forest, streams or lakes. The walker should not have to retrace his steps.

In the interest of the children and the teaching of elementary science, Dr. and Mrs. Franklin H. McNutt offered the Board of Trustees of the Greensboro City Adminstrative Unit a ten-year lease on an area of land to be used for a nature trail. The Board of Trustees accepted the offer November 22, 1950. The Greensboro Junior Chamber of Commerce furnished the materials to build the sanitary facilities. A formal lease was signed effective January 1, 1951 for a ten-year period at one dollar per year. Consult Appendix B for details of the transactions.

The area of land known as the Franklin McNutt Nature Trail is being developed according to the criteria approved by the Criteria Committee.

CHAPTER III

PREPARATION FOR THE NATURE TRAIL EXPERIENCE

Introduction

During the past decade the instructional materials for elementary science have passed through radical changes in content, methods, and form. Elementary science has been coordinated with other subjects, such as social studies. Instructional materials may be classified as textbooks, supplementary reading materials (books, pamphlets, maps, newspapers) and audio-visual materials. Much of the supplementary reading and audio-visual materials may be obtained from government and local agencies.[1]

Instructional Materials

Instead of presenting abstract ideas to be stored for instant regurgitation on demand, the textbook's main aim is to present materials in a meaningful way, to capitalize on the childrens' experiences, and to develop some generalizations in science that will be useful in day to day living. Facts must be learned, but the experiences of the children must hold and support them or they will fall.

Most science textbooks contain more space for illustration than print. Science is taught as a visual experience. Accompanying film-

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1. Consult Appendix C for list of agencies.

strips are being produced by the publishers. Most authors correlate their texts with existing audio-visual aids. Consult appendix D for recommended textbooks.

> A variety of different levels of reading matter must be made available so that every child who can read at all will have easy access to studying science through the printed page. [2]

Every child must be able to participate in the discussion, experimenting and planning periods and be able to give as well as to take something relative to his scientific experiences. Each child will follow his individual pattern in developing concepts. Some children by reason of mentality and background may be able to understand only the simplest concepts of the balance in nature. Others in the same group may be ready to understand the more difficult concepts such as chemical processes and stages of succession in the same subject. An abundance of supplementary reading materials must be available.[3]

Appendix E contains a selected bibliography of teaching aids for the teacher. Most of this material can be obtained free or for printing cost.

Multi-sensory or audio-visual materials have always been the best way of communicating ideas. The crude picture writing of the cave man, smoke signals, paintings, the cries of animals, the sounds of insects, and the odors of food-all convey instant ideas. These primitive forms of multi-sensory communications have been changed by technological developments.

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2. Preston, Ralph C. "Using What We Know About Children in Developing Science Learning." Journal of the Association for Childhood Education International, 26 (March 1950), p. 299.

3. Appendix D contains a selected list of supplementary reading materials for the Franklin McNutt Nature Trail Activities.

The film, radio, and television bring to the classroom many experiences which help to equalize the background of all the children. The alert teacher will take advantage of these audio-visual materials. Appendix F lists materials suitable for elementary children.[4] An asterisk indicates the materials should be used before visiting the nature trail.

Field Trip Courtesy

Preliminary walks should be made on the school campus to orientate the students in field trip courtesy, which should include the following:

A. Walk in single or double file as directed.

B. Follow the directions of your leader.

C. Don't yell or point. Call attention to objects missed or overlooked by your leader in a quiet manner.

D. Other students will enjoy the plants and animals if you do not collect them. No plant or animal may be collected from the nature trail.

Have as few rules as possible. Encourage the children to make their own regulations for the good of the group. It is better to take short trips at first, trying out one rule; then add more rules as the children become accustomed to the walks.

The discoveries and ideas of children should be respected. Serious attention should be given to the things children find on field trips to encourage their interest and observation. After groups are

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4. Audio-visual materials listed may be obtained from the Audio-Visual Education Department, Greensboro Public Schools, Greensboro, North Carolina.

accustomed to the simple rules of field trip courtesy, a trip to the nature trail may be planned.

The Pre-Visit to the Franklin McNutt Nature Trail

The teacher must make a visit to the trail **before** taking the class out. The purpose of the nature trail is to demonstrate the balance of nature and the interrelationship of all living things and thus create a keen observation and interest in conservation. The teacher should not try to set apart specific plants or animals but the trail must be presented to the children in its entirety. Signs have been placed on the trail illustrating areas of interest instead of plants or animals. A simple schematic (Photograph No. 2) of the trail indicating areas has been prepared as a guide for the teacher. A brief description and photograph of each numbered (1-10) area is included. The trail schematic should be used to indicate points of interest by the children.[5]

Parking Area and Shelter

(Photograph No. 3)

The shelter provides storage for supplies. Note the mud dauber's nest on the barn door. During the fall and spring look for the doodle bug holes under the shelter. Call attention to the specimen of poison ivy on the oak tree directly in front of shelter. This

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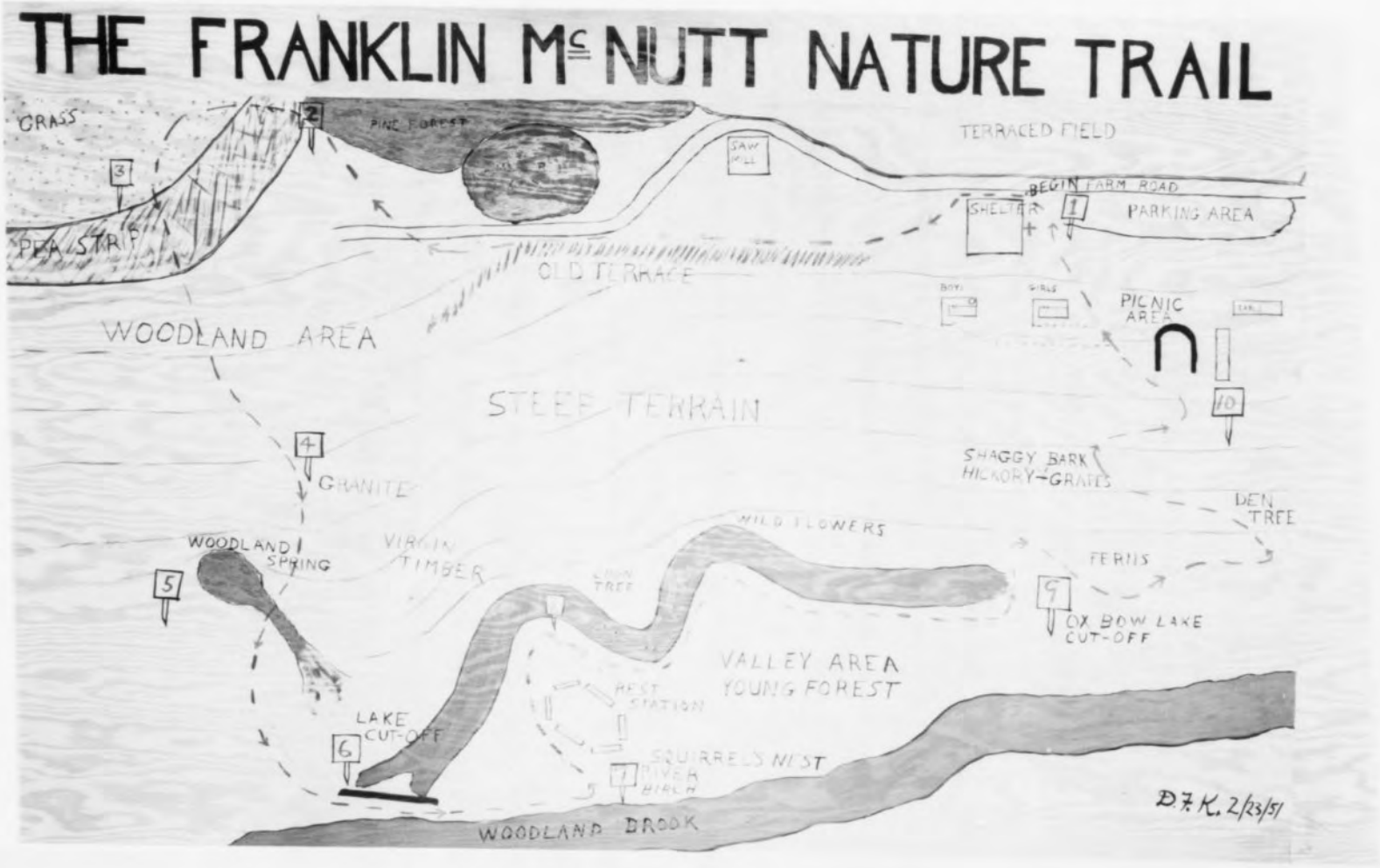
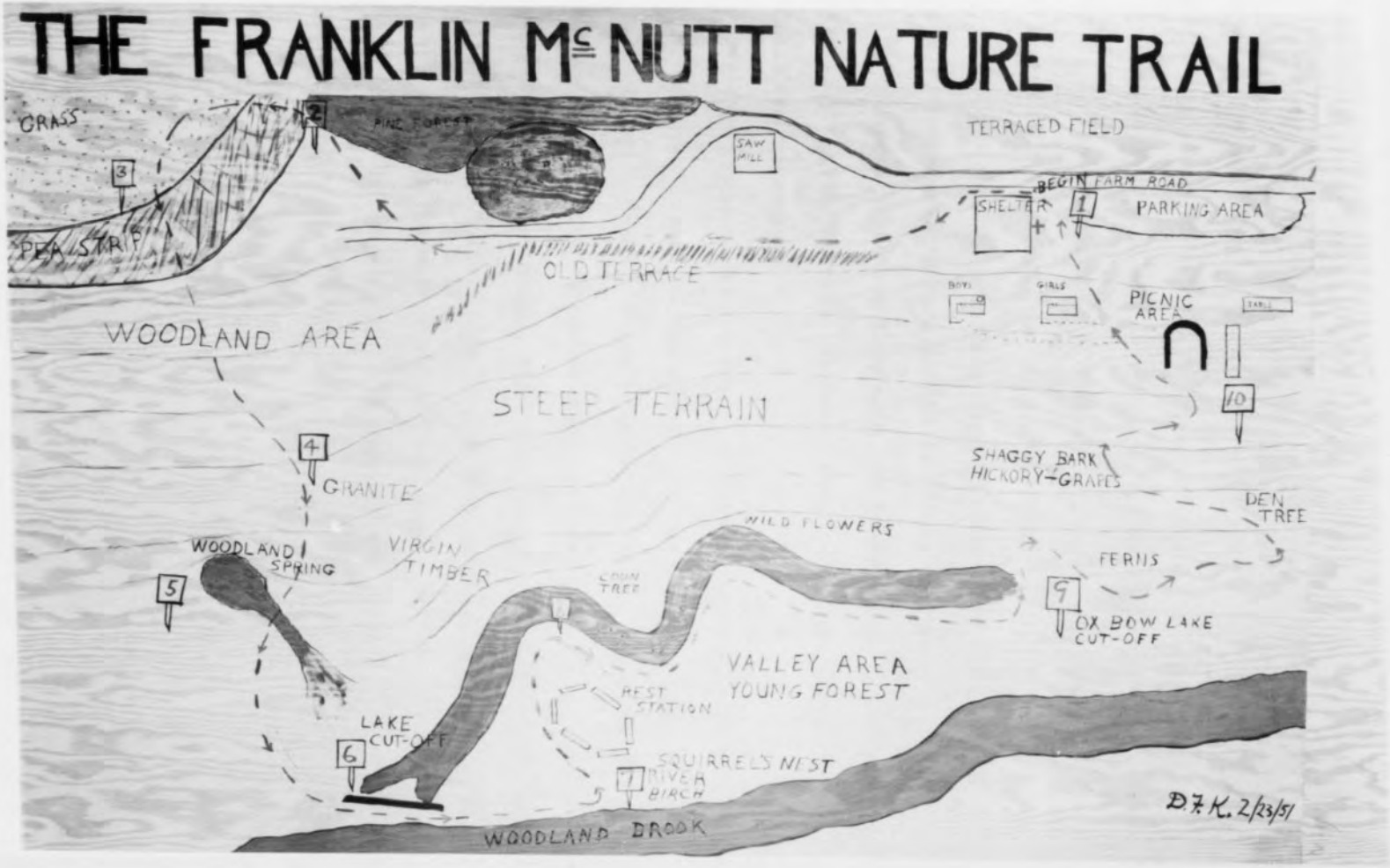
5. Additional copies of the schematic, Photograph No. 2, may be obtained from the Audio-Visual Education Department, Greensboro Public Schools, Greensboro, North Carolina.


THE FRANKLIN Mc NUTT NATURE TRAIL
GRASS
PINE FOREST
TERRACED FIELD
SAW MILL
BEGIN FARM ROAD
SHELTER
PARKING AREA
OLD TERRACE
BOYS
GIRLS
PICNIC AREA
WOODLAND AREA
STEEP TERRAIN
GRANITE
SHAGGY BARK HICKORY-GRAPES
DEN TREE
WILD FLOWERS
WOODLAND SPRING
VIRGIN TIMBER
FERNS
OX BOW LAKE CUT-OFF
VALLEY AREA YOUNG FOREST
REST STATION
LAKE CUT-OFF
SQUIRREL'S NEST
WOODLAND BROOK
D.F.K. 2/23/51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REST STATION
LAKE CUT-OFF
SQUIRREL'S NEST
RIVER BIRCH
WOODLAND BROOK
D.F.K. 2/23/51

specimen will be red in the fall and green in the spring and summer. Remember; "Three leaves, I hurt you. Five leaves, I will not hurt you."

Identify the different oak trees around the shelter and parking area. You will find at least three kinds - white, post, and red oaks. Notice the group of red bud or Judas trees in the shelter area. Explain the principle of soil conservation by the terraced field. Show how decaying leaves form humus - a spongy, top soil of decayed vegetation which is essential to soil and water conservation.

White top asters, polk, dandelions, rabbit tobacco, wild sun flowers, black-eyed susans, meadow beauties, milkweed, and joe-pye-weed may be observed in season from area one to area two. Praying mantis, caterpillars, grasshoppers, spiders, lizards, grubs, bugs, and other animals are present.

A cross section of a tree, sanded and varnished to show annular rings, has been placed at the shelter. Explain and count the rings.

In going from area one to area two follow the trail as indicated avoiding the saw mill and water supply. White oak, post oak, red oak, beech, sugar maple, hickory, sweet gum, red bud, dogwood, ash, American elm, black haw, old field pine, scrub pine, and red cedar are among the trees to be found between areas one and two. Call attention to the old terrace along the trail. Emphasize the part the forest plays in in soil and water conservation.

Young Pine Forest

(Photograph No. 4)

Note the young forest of pines. Two species of pines are prominent - the old field and scrub pine. This field was at one time in cultivation and later abandoned. It grew a crop of weeds with the white top asters predominating the first few years; then broom sedge began to appear. The broom sedge succeeded the weeds and asters. Pine seedlings appeared in the sedge and within a few years the pines succeeded the sedge. The strongest pines soon choked out the weaker pines because pine seedlings will not grow under other pines. Seedlings of hardwood trees appeared under the pine trees. The hardwood forest (beech, maple, ash, oak, hickory, elm, poplar, gum) will succeed the pine forest. Thus the abandoned land will be covered again by the native virgin forest. At this point observe the following:

1. Needles and cones on the different species of pines.
2. Reindeer lichens or moss.
3. Broom sedge.
4. Hardwood seedlings.
5. Pine straw and depth of top soil.

Soil and Wildlife Conservation

(Photograph No. 5)

Man-made conservation measures are practiced here. Top soil is held in place by a cover crop (grasses) and a strip of peas planted on the edge of the field. The peas provide nitrogen, prevent erosion, and furnish food and shelter for wildlife. In passing from area three to area four, note to the left the large hardwood trees which are part of the original virgin forest typical of Piedmont North Carolina.

The Formation of Soil

(Photograph No. 6)

The out-cropping of blue granite is typical of this area. The lowly lichens are at work, breaking down the rocks into soil by chemical reactions of their by-products of growth. Crevices are formed by the lichens. These crevices catch water, soil, and seeds. Rocks may be broken by the thawing and freezing of water. Generally enough soil is available for the moss to start growing; later, a seed plant will start as the supply of soil increases. Over a period of time the rock is disintegrated into soil by the water, chemical reaction, and roots of plants.

forest soil. It is as clear and cool as the water from the "old oaken bucket." If a forest fire burned over this area, what do you think would happen to the spring?

Note the ferns and moss around the spring. Wild touch-me-nots or jewel weeds are prominent in the drainage. Wild flowers, such as violets, bloodroot, jack-in-the-pulpit, trillium, and bluets, may be found in season between areas five and six.

A Woodland Brook

(Photograph No. 8)

Originally the Ox Bow Lake dam was a natural formation. Some person drained the lake, which necessitated a cement backing for the dam. The water in the woodland brook is clear except after a rain. It is muddy during rainy weather because of surface water drained from cultivated fields. Many water animals cannot live in these streams. The brooks originally furnished clear water due to the balance in nature. Water conservation will maintain this balance and give us clear streams again. Look for small fish, crayfish, salamanders, and water snails. Turtles may be found in season.

Examine the brook bed. Do you find mud? Is this a natural state? What should be found in the brook bed? Examine the sand and gravel. Take a sample to the classroom, wash and examine by magnifying glass. Note the smooth surface and shapes of the small rocks.

Look for small fish, crayfish, salamanders, and water snails. Frogs and turtles may be found in season.

A Young Forest

(Photograph No. 9)

Look up in the dead birch tree for the squirrel's summer home. Can you find his winter home? In which home does the squirrel store food? Raise a family? Notice the river birches. Feel the birch bark. The inner bark and twigs of birch are distilled for a thin oil known commercially as oil of wintergreen.

Notice the nature of trees and shrubs in this area. Find the ironwood. This valley area will have an abundant amount of wild flowers in season. Observe the sycamore and tulip poplar trees. Has this valley been cleared? If so, how recently? How can you tell?

On the trail near the Ox Bow Lake, notice the stump covered with lichens and mushrooms. How long do you think it will take this stump to decay?

An area has been cleared for a rest station. Be quiet for a few minutes. Allow the birds and other animals to entertain the children. It takes a quiet period of fifteen to thirty minutes to bring the animals out. Look and listen - don't point or make sudden movements. If the children are not trained in this procedure the rest area should be avoided.

The Ox Bow Lake

(Photograph No. 10)

The Ox Bow Lake is an old stream bed cut off from the brook. Observe the shape of the lake which gives it the name, Ox Bow. The lake is supplied by drainage from the steep terrain and wet weather springs. The water level does not vary too much since evaporation and seepage is approximately equal to the water supply. Small fish have been placed in the lake for mosquito control. Notice the frog eggs, tadpoles, crayfish, and water snails in season. A coon made his home in a den tree across the lake from the rest station. Find other den trees and logs which provide homes for the wildlife.

Wild flowers grow in abundance in this area. Violets, jack-in-the-pulpit, trilliums, wild pinks, wild orchids, wild geraniums, spring beauties, self heal, hepaticas, gentians, bluets, adderstongues, bellworts, soloman seals, bloodroot, wild gentian and many others in season. Do not pick the flowers or try to transplant them, for they will die.

What color is the water in the Ox Bow Lake? Observe bubbles coming from the bottom of the lake. This is marsh gas caused by decaying vegetation. The lake is gradually filling up with decaying leaves. Collect a leaf from the lake bottom with a small amount of lake water. Observe the life in a drop of water with the aid of a magnifier.

Certain trees and shrubs in this area will soon die from shade. Can you find them? In order to obtain light the trees are tall. The survival of the strongest scheme of nature is being demonstrated by this young forest. Can you find where the old clearing ended?

The Ox Bow Lake Cut-Off Area

(Photograph No. 11)

Ox Bow Cut-Off - At this point the lake is cut-off from further water supply. The valley is level without signs of wet weather springs.

A shaggy bark hickory is located to the left of the cut-off. How did the grape vine get to the top of this tree? The grape vine grew with the tree. Squirrels prefer hickory nuts from the shaggy bark hickory. Grapes are excellent food for wildlife.

Mushrooms, lichens, and insects are at work on the fallen trees. Note the stages of decay. Soon these trees will be humus. Feel the spongy humus held in place by roots on this steep terrain. Can you find the sign of soil erosion? The spongy layer filters water, making it clear and free of contamination.

The Christmas fern grows in this area. Why is it called a Christmas fern? How do ferns reproduce? This fern stays green all winter. Ferns do not have true roots. They have root stalks which grow to be very old. Note several ferns growing from one root stalk. (These ferns cannot be transplanted successfully.)

From areas nine to ten look for woodland plants. The forest in the valley is young and on the slope it approaches the original virgin forest. Notice the large oaks, beech, poplars, and maple trees. How old do you think they are?

Picnic Area

(Photograph No. 12)

The picnic area is provided for your use and convenience. Proper picnic practices must be observed to keep this area sanitary and to prevent fires. A clean-up committee must function to keep the grounds free of all trash and garbage.

In no case turn the children loose without supervision. If afternoon activities are not planned, return to the school immediately after lunch.

Final Preparation Procedures

Before taking the children on the nature trail the following procedures should be observed:

1. Obtain permission from the parents. Permit forms may be obtained from the principal.
2. Caution the children to wear clothes suitable for the occasion and weather.
3. A first-aid station, adequate for all simple accidents, is located at the shelter.

4. Try to secure parents with an interest in nature to help with the groups and provide transportation.
5. A picnic area is provided for your convenience. Good camping techniques should be observed. Special attention should be paid to the disposal of garbage and all fires.
6. Drinking water may be obtained from the spring. If you do not want to use the spring, water must be carried from the school.
7. Do not bring nets or containers for collecting specimens.[6] Be sure the children understand that no plant or animal is to be collected from the nature trail.
8. Practically all the species of trees and woodland plants of Piedmont North Carolina are found on the trail. Study the tree manual prepared by the North Carolina Department of Conservation and Development and the filmstrip, How To Know Trees, produced by the Row-Peterson Company. The fauna may be found if one will stop - look - listen.
9. Caution the children about poison ivy. The trails have been sprayed to prevent its growth, but there is plenty left, off the trail area.
10. It will take about two hours to go around the trail. All activities must be organized and supervised. Under no circumstances should the children be without supervision.

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6. Exception - two small jars for the collection of pond water and brook bottom.

The schedule below is suggested:

Arrive 9:30 - 10:00 A.M.

Nature Trail 10:00 - 12:00 A.M.

Lunch and Rest 12:00 - 1:00 P.M.

Nature Games 1:00 - 1:30 P.M.

Art 1:30 - 2:30 P.M.

Most groups do not stay after 12:30 or 1:00 P.M.; however, during warm weather additional time may be profitably utilized. Helps in nature games, crafts, and art may be found in many nature guides.

11. If the trip is made during early fall or late spring, examine the children for ticks. Most wood ticks are harmless and if found within a few hours can be removed without danger of infection from the bite or spotted fever.
12. Arrangements for the trip must be made through the Audio-Visual Education Department, Greensboro Public Schools, 501 Asheboro Street.

CHAPTER IV

THE NATURE TRAIL

During the past decade or more, increased emphasis has been laid on the teaching of science in the elementary grades. More important, the point of view has been shifted from so-called nature study programs, consisting of the identification of plants, animals, and minerals obtained mostly from books, to a firsthand study of characteristics of the child's environment and their effective interrelationships. "There has been a decided trend towards uniting the various curriculum areas and bringing the resources of art, science, social studies, language arts, and others to bear upon broad problems."[1] The Franklin McNutt Nature Trail is designed as a living textbook to demonstrate the following objectives:

1. The interrelationship and balance of nature.
2. Forest, soil, and water conservation.
3. The observation of seasonal changes in plants and animals.
4. Cultivation of keen observation on the part of the child and an appreciation of his immediate environment.

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1. National Education Association, Department of American Association of School Administrators. Conservation Education in American Schools, Twenty-Ninth Yearbook, Washington, D. C. The Association, 1951. p. 119.

Through the use of 2 x 2" kodachrome slides a visit to the Franklin McNutt Nature Trail will be illustrated.[2]

Slide No. 1 - Schematic of the Nature Trail

The nature trail is shown in its entirety with numbers identifying the areas of interest. Arrows and numbers will guide the class.

Plants and animals typical of Piedmont North Carolina may be found in season.

Slide No. 2 - Energy For First Graders (Area No. 1)[3]

Small children must have their mid-morning milk before starting on the trail. While full of energy at the beginning, first graders soon tire on the trail. This is their last chance for nourishment during the next two hours.

Slide No. 3 - Mud Dauber's Nest (Area No. 1 - Barn Door)

A grade mother points out and explains the mud dauber's nest to this first grade group. Mud daubers use a rock in their mouths to form their nests. Their nests are built to lay eggs in and to hold food for their young. Interested grade mothers provide transportation and additional leadership on the trail.

Slide No. 4 - A Decaying Stump (Area No. 1)

This stump is in one of the last stages of decay. It is the home of beetles and ants. The remaining wood can be crumbled in the hands. By the action of the molds, mushrooms, insects, and

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2. Kodachrome slides have been deposited as a part of this thesis in the Woman's College Library, University of North Carolina, Greensboro, North Carolina. The pictures were made in the late fall-winter season.

3. Numbered areas on the schematic, Slide No. 1 and Photograph No. 2, Chapter III.

birds this stump is breaking down to the existing woodland humus.

Slide No. 5 - Forest Humus (Area No. 1)

Rich humus - the result of decaying leaves, stumps, and other vegetation. Feel its texture; note that the roots hold it in place. This is one of nature's sponges for absorbing and filtering water. Soil erosion is absent. All of our land was once covered by this rich, top soil. When man disturbed the balance in nature, our top soil left us.

Slide No. 6 - Poison Ivy or Oak on a Tree (Area No. 1)

"Beware! Leaflets, three, quickly flee! Watch Out!"[4] The leaflets of poison ivy will turn brown or red in the winter and fall. Don't let the beauty of the fall leaves fool you - it's still poison ivy.

Slide No. 7 - Poison Ivy on Ground (Area No. 1)

Whether on the ground as a shrub or on the tree as a vine, poison ivy is still dangerous and should be avoided. The trail areas have been sprayed to eliminate the poison ivy. The plant is abundant off the trail areas.

Slide No. 8 - Red Cedar (Area No. 2)

Pencils, posts or cedar chests are growing here. The cedar wood is soft, strong, aromatic, of even texture, and durable in contact with soil. These qualities make it a very useful product for pencils, posts, interior woods, and rustic work. An added value is

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4. Weaver, Richard L., The Nature Trail. Greenwich, Connecticut. Audubon Nature Center, 1945. p. 3.

its decorative finish of red and white layers. The increasing demand for Christmas trees has increased the value of red cedar trees, giving an additional source of income to the farmer.

Slide No. 9 - Cedar Berries (Area No. 2)

A favorite winter food for birds. Birds scatter the seeds and this accounts for the wide distribution of red cedar. The male tree blooms in February or March. The pollen gives the male tree a golden color during early spring. Berries are pale blue with a sweet waxy flesh.

Slide No. 10 - Sugar Maple Leaves (Fall) (Area No. 2)

Every leaf on this tree is a sugar factory. Not coal, nor oil, nor gas, nor electricity, but energy from the sun is the power that runs sugar leaf "factories." The chlorophyll (green coloring in leaves), water, and carbon dioxide in combination with the sun's energy make the elemental food of all life - sugar. Carbon dioxide exhaled by you and other animals on the trail and the water from the ground beneath your feet are the raw materials from which leaves make sugar.

Slide No. 11 - Annular Rings of a Tree (Area No. 2)

These children are counting the growth rings of the log. The age of the tree is always impressive. Variation in the width of rings depends on favorable and unfavorable seasons. Tree rings are narrow in years of drought, wider in years of normal precipitation. By observation of the tree ring patterns a record of dry and wet years may be made for at least one hundred years.

Slide No. 12 - Lizard on Log (Area No. 2)

A perfect camouflage and pattern matching is shown here. The lizard is harmless and may be handled. Its diet of flies and insects makes it one of our most valuable helpers.

Slide No. 13 - Lizard (Close-up) (Area No. 2)

A close-up of Mr. Lizard. The camouflage and pattern matching is his best defense against natural enemies.

Slide No. 14 - A Young Pine Forest (Area No. 2)

A young pine forest has shaded out the broom sedge. Soon the weakest pines will be eliminated by the stronger pine trees. Hardwood seedlings are beginning to appear under the pines. About fifty years ago this land was in cultivation but was later abandoned White top asters, golden rods, and wild grasses covered the area. Soon broom sedge choked out the other plants. Pine seedlings grew in the broom sedge. The dense pine shade eliminated the grasses. Pine seedlings will not grow under pine trees. Hardwood trees, such as oak and hickory, will eventually crowd out the pine forest.[5]

Slide No. 15 - Young Pine Forest - Species of Pine (Area No. 2)

Two common species of pines are present - the "scrub" or Virginia and the "old field" or Rosemary pine. Notice the difference of the two pines in form and coloration.

Slide No. 16 - Bark - "Scrub" Pine

Now let's look at the bark. This is the bark of the scrub

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5. Rogers, Hollis, Dr. Field Notes on the Franklin McNutt Nature Trail. Education 660 B, Elementary Science. Greensboro, North Carolina: The Graduate School, University of North Carolina, Woman's College Division, 1950.

or Virginia pine. Note the smooth appearance of the bark. The bark is thin, reddish-brown, and broken into shallow plates.

Slide No. 17 - Bark - "Old Field Pine" (Area No. 2)

The thick, rough appearance of the bark is characteristic of this species of pine.

Slide No. 18 - Pine Needles (Area No. 2)

The Virginia or "scrub" pine holds the cones for several years. The leaves (needles are one and a half to three inches long) are the shortest of any species in the state. The twisting and spreading leaves are borne two in a cluster. The needles of the "old field" pine are three to five inches long and are borne in clusters of two or three.

Slide No. 19 - Reindeer Lichens (Area No. 2)

Reindeer lichens grow in the dense shade of the pine forest. The light, moisture, temperature, and decaying vegetation are suitable for the habitat of this plant. The lichens are helping in the preparation of woodland humus so important in soil and water conservation.

Slide No. 20 - Soil Conservation (Area No. 3)

This field demonstrates proper soil conservation methods used in farming. The outer edges are planted in peas. The peas furnish nitrogen for the soil, prevent soil erosion on slopes, and furnish food for wildlife. Note the contour method used in planting crops.

Slide No. 21 - Nature Trail Techniques (Area No. 3)

Single file is the order of the day on the nature trail. At points of interest children gather around their leader.

Slide No. 22 - Spider and Web (Area No. 4)

During the summer and fall these beautiful spiders built their webs across the trail paths. Notice the pattern of the web. How can a spider construct its web across a path? These spiders are harmless and catch insects such as flies and grasshoppers. Spiders should be protected and never destroyed.

Slide No. 23 - Egg Sacs of the Spider (Area No. 4)

Spiders lay their eggs in these protecting sacs. Next spring the eggs will hatch and the young spiders will break their way out of the sacs.

Slide No. 24 - A Home for Wild Animals (Area No. 4)

An old decaying, up-turned tree stump provides a home for wild animals. What's in the hole? A rabbit, chipmunk, opossum, skunk, or snake?

Observe the state of decay. Many of the roots and the stump have already been changed to humus. This tree was probably up-rooted by a storm. The trunk of the tree was used for fire wood or other uses on the farm.

Slide No. 25 - Den Tree (Area No. 9)

Dry rot caused by fungus attacked this tree. From the shape of the trunk a struggle for life against disease has been made. Birds, such as woodpeckers, have kept the insects under control. The hollow provides a home for squirrels and birds. Dead timber offers shelter for squirrels, mice, owls, chickadees, muthatchers, raccoons, skunks, opossums, and many species of insects.

Slide No. 26 - A Squirrel's Nest (Area No. 7)

Squirrels leave their winter homes in hollow trees during spring and build nests such as this one from leaves. The nests are waterproof and cool. In addition a lot of fleas are left behind in their old home.

Slide No. 27 - A Squirrel's Nest (Area No. 7)

Another squirrel's nest in a sycamore tree. Notice the characteristic white bark of the tree. The poplar tree to the left shows the smooth pattern of its bark.

Slide No. 28 - Young Forest (Area No. 7)

These are the trees of the young forest in the valley between the woodland brook and the Ox Bow Lake. Notice how tall the trees are. They are still fighting the continuous battle for light. The weaker trees will soon be choked out by the stronger trees, repeating the age old fight of the survival of the strongest in nature.

Slide No. 29 - Insect Galls (Area No. 4)

This dogwood has many insect galls. Are the insects at home?

Slide No. 30 - Insect Galls (Area No. 4)

Each gall is hollow. The dogwood has grown around the insect larva thus providing a protective home.

Slide No. 31 - Insect Gall - Close-up (Area No. 4)

Mr. Insect is not at home. When the larva is grown, he eats his way out. The eggs were deposited under the skin of the dogwood which furnished food and a protective home until the larva was grown.

Slide No. 32 - Grape Vines (Area No. 9)

Many grape vines are present along the trail. They provide food and shelter for wildlife. How does a grape vine get to the top of a tree? It grows with the tree. The lower, smaller branches of both tree and grape vine break off, while the main stem of each increases in size.

Slide No. 33 - Red Oak Twigs With Buds (Area No. 4)

The age of a twig may be found by counting the bud scars or rings around the twig. (Do not count leaf scars) Each bud has baby leaves or flowering buds or both, which will start growing next spring. Most buds are covered by a protective cap during the winter season.

Slide No. 34 - Hickory Bud (Area No. 4)

This large bud is characteristic of the hickory tree. Trees and shrubs may be identified by their buds. How old is this twig?

Slide No. 35 - Black Walnut Twig (Area No. 4)

The rough appearance is characteristic of the walnut twig. Note the many leaf scars. A compound leaf was fastened to every leaf scar. How old is this twig?

Slide No. 36 - Up-Rooted White Oak Stump (Area No. 1)

The root system of trees is important. Water and mineral salts are absorbed by the small roots (root hairs). Other roots, such as the large tap root, serve as anchorage for the tree and carry water and food.

Slide No. 37 - Red Cedar Roots (Area No. 3)

Note the spreading root system of the red cedar. There are about as many roots as limbs on a tree. If the small roots absorb water and minerals, where would be the proper place to feed the tree - at the trunk or under the ends of the limbs?

Slide No. 38 - Red Oak and Hickory Bark (Area No. 5)

Trees have characteristic barks. The large tree is the southern red oak. The small sapling is hickory. Hickory makes a light, strong, elastic wood used for tool handles.

Slide No. 39 - Dogwood Bark (Area No. 5)

Do you recognize the alligator bark? This is the bark of the dogwood tree - the state flower of North Carolina.

Slide No. 40 - White Oak Bark (Area No. 5)

This light colored bark is characteristic of the white oak. Note the poison ivy vines on the side of the tree. The tree provides anchorage for the vine. Some water and minerals may be absorbed by the poison ivy roots on the tree, but it manufactures food and is not a parasite on the tree.

Slide No. 41 - Lichens on Granite (Area No. 4)

Lichens are the first plants to grow on bare rocks. They build soil by catching dust and breaking down the rocks by chemical action of the secretions. Water catches in the cracks and crevices made by lichens. The freezing and thawing of water help to break the rocks. This is an out-cropping of blue granite typical of Piedmont North Carolina.

As soon as the lichens build enough soil, mosses begin to grow. The moss will help the soil and break down the rock in a similar manner as the lichens.

Slide No. 42 - Moss (Area No. 4)

This moss is growing on a pile of decaying vegetation (wood and leaves). The next stage is wood humus. Note the reindeer lichen.

Slide No. 43 - Moss (Close-up) (Area No. 4)

The small brown capsules above the moss hold spores. This is one way the moss reproduces. Mosses are soil builders, water preservers and beautifiers in nature. The lichens build soil for mosses; the mosses build soil for ferns and larger plants. It takes 1000 years to build an inch of soil. How old is the soil around the moss?

Slides 44-46 - Fungi (Areas No. 4-5)

Many fungi help in breaking down these stumps and tree laps into wood humus. (45) Various mushrooms and molds at work. Fungi do not have chlorophyll (green coloring matter) and cannot manufacture their own food. (46) The dead stumps and trees provide food for the fungi, and the fungi by their growth secrete a chemical substance to increase decay of vegetation.

Slide 47 - Woodland Spring (Area No. 5)

The approach to the woodland spring during spring and summer is covered with jewel flower, violets, and other water plants. Salamanders and water snails may be found.

Slide No. 48 - Woodland Spring (Close-up) (Area No. 5)

Would you like to drink from this spring? Note the moss and ferns around the edge of the spring. The leaves have covered the water. The spring has been cleaned out and cemented. It furnishes cool, clear water for drinking.

The spongy, woodland humus absorbs water which is filtered to the water table. When the water table comes to the surface, it is a spring. This spring has never been known to go dry during a drought. The water table reserve is large due to the forest area. If the forest was cleared and the top soil lost due to the lack of soil conservation, the water table would be lower, resulting in a dry spring.

Slide No. 49 - Ox Bow Lake (Area No. 8)

The Ox Bow Lake is in the shape of an ox bow. It is not a stream but a natural lake formed by an old stream bed. The lake is fed by wet weather springs and drainage from the surrounding terrain. The water supply equals the loss by seepage with the water level remaining practically constant.

Slide No. 50 - Ox Bow Lake - Lower Part (Area No. 6)

The lower part of the lake is no larger than the upper part. The dam is a natural one. As a precaution, a cement dam has been placed back of the natural dam.

The tree with the light gray bark is the beech tree. Beech trees cast a very dense shade. Beech and maple saplings are the only trees able to live under the beech shade.

Slide No. 51 - Ferns (Area No. 8)

The Christmas fern grows in moist places and stays green all winter. A single leaflet looks like a Christmas stocking. The leaves called fronds grow from an underground stem, rhizome. Many fronds grow on a simple rhizome which may be over one hundred years old. The rhizome grows only a fraction of an inch per year.

Slide No. 52 - Fern Fronds With Spores (Area No. 8)

The brown spots on the leaflet are not bugs, but spore cases. The fern reproduces by growth of the underground stem, rhizome and by spores. Ferns succeed mosses in soil building, thereby furnishing enough soil for seed bearing plants.

Slide No. 53 - Lichens With Spores (Area No. 8)

Under proper conditions of light, moisture, and temperature, lichens grow on the living or dead trees. Look closely for spore cases. Pink fruiting bodies represent source of commercial litmus and other dyes.

Slide No. 54 - Lichens on Tree (Area No. 9)

Note the abundant growth of lichens on one side of the tree while the other sides contain only a few. How can you account for this? No, this isn't the north side of the tree. When the conditions of light, moisture, and temperature are favorable, lichens will grow. This is the southwest side of a tree in a small valley.

Slide No. 55 - Puff Ball (Area No. 10)

Some species of puff balls are edible. When the spores are ripe, the cases break, allowing the spores to be puffed out by the

first animal that steps on it. Some species of puff balls are known as the "devil's snuff box" because their brown spores resemble snuff.

Slide No. 56 - Picnic Grounds (Area No. 10)

Tables and a place to cook have been provided. Food - any food tastes good after walking around the Franklin McMutt Nature Trail. After lunch the children return to school. Additional time may be spent in observing farm activities. This completes the visit to the nature trail.

CHAPTER V

OUTGROWTHS OF THE NATURE TRAIL EXPERIENCES

> Experience is the soil out of which the language of the young child grows.[1]

Common experience fosters communication - reading, talking, listening, writing, painting, music, and dramatics. The group experience has the advantage over the individual experience in that it offers a common basis for learning activities for all the children. Oral and written communication enriches, clarifies, and interprets experiences. The language arts (reading, writing, listening, and talking) are concerned primarly with the communication of ideas which is a two-way process - the receiving of ideas from others and giving ideas to others. From this consideration, skills are secondary to the communication of the idea.

Man has always been concerned with the communication of ideas. Our media of communication have changed from the crude symbols of the cave man to television. The multi-sensory experiences have caused human beings to express themselves by symbols, reading, writing, painting, music, talking, dancing, and dramatics. How well these experiences are expressed depend on the skills used in conveying the ideas and the common experiences of the recipient.

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1. Beery, Althea. "Experience - the Source of Communications." Journal of the Association For Childhood Education International, 27 (February 1951), p. 278.

The preparation of the class and the visit to the Franklin McNutt Nature Trail will provide the stimulus and the motivating force for expressions in the language and visual arts. In evidence, classroom activities are herewith submitted.

PREPARATION OF THE THIRD GRADE FOR THE FRANKLIN MCNUTT NATURE TRAIL[2]

I. Preliminary Preparations for the Teacher

A. Pre-visit to the nature trail to get acquainted with it.

B. Securing permission from the principal to make the trip.

C. Arranging for several parents to provide transportation. Obtain parents with an interest in science or scouting. Let the parents help supervise the groups on the trail.

D. Securing field trip permit slips from the office.

E. Discussing with the children what they wish to learn from the trip. (List specific questions to gather information.)

F. The primary objective of the trail is to demonstrate the balance in nature with emphasis on water and soil conservation. In accomplishing the primary objective the following outgrowths may be realized:

1. Observation of signs of the seasons (Spring).

2. Enjoyment of the beauties of nature.

3. A sense of property rights - care of the trail and picnic area.

4. A responsibility for the safety of others and self on the trip.

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2. Adapted from the preparation materials of Miss Estelle MacDonald's Third-Grade, Caldwell School, Greensboro Public Schools, Greensboro, North Carolina.


February 7, 1951
Wednesday
Today
Our Nature Trip
I Way of Travel - Automobiles
II Safety Rules to practice
III Visit Dr. McNutts Farm
A. Walk over the farm
find signs of

5. Ability to plan with others on common needs and problems.
6. Courtesy to those from whom one is asking favors.
7. Satisfaction in acquiring information.
8. Developing habits of observation.
9. Developing vocabulary.
10. An increased interest in reading science books.
11. Ideas of proper behavior in large groups - (quiet voices - inconspicuous actions).
12. Sharing experiences with others through drawings, music, stories, poems, riddles, radio, and television.
13. Giving the children information which will help them to solve problems in their immediate environment.

G. Appointment of a leader for groups of children.
1. Divide children into groups of five or six with a leader.
2. List names for checking at meal time and home-going.

H. Evaluation of the trip by the children and teacher.

II. Room Preparation - Class Discussion

A. Arithmetic
1. The number of people going on trip. (Addition)
2. The number of cars needed. (Division)
3. The amount of food to bring.
4. The total cost and cost per person of food.

B. Language Arts

1. Write notes asking parents for transportation and permission to go on the trip.

2. Make class charts of the following:

Room Chart I – Our Nature Trail (Children illustrate with pictures)

We are going on a trip.

We are going to Dr. McNutt's farm.

We will go in the springtime.

Mr. Keller and Mrs. Wall will set the date.

We will ride in an automobile.

We will need at least five cars.

Room Chart II – Our Nature Trail

We will need cars to ride in.

We will ask our mothers to take us.

We will write them a letter.

We will invite Mrs. Wall to go with us.

Chart III – Our Letter

Caldwell School

Date_____

Dear Mother or Mrs._____:

Our grade would like to visit the nature trail at Dr. Franklin McNutt's farm. We need five cars to take all of us out there. Can you drive your car and go with us for the day? We want to cook and eat our lunch at the end of the trail.

We want to go ___(date)_____. We will have a good time.

Your (child or friend)

Chart IV - Things We Want to Look For

How soil is made.

How the forest conserves water and soil.

The interrelationship of plants and animals.

Signs of spring in weather, earth, trees, flowers, birds, and insects.

C. Our practice trips on the school campus to help us organize.

1. Our safety practices.

2. Our field trip courtesy.

3. Our group procedures.

III. Probable Outcomes of Nature Trail

A. The working and sharing of a common problem.

1. Every child participating in the planning of the trip.

2. The ability to organize and cooperate as a group.

3. The ability to offer helpful suggestions when needed.

4. The ability to seek information through observation.

B. Language Arts

1. Recording observations.

2. Writing television scripts.

3. Reading science stories and poems.

4. Composing music and poems.

5. Sharing experiences with others.

6. Writing riddles and thank-you letters.

C. Art

1. Frieze of seasons.

2. Design covers for booklets.

3. Paint pictures of experiences on trip.

D. Television and Radio

1. Write a radio script and adapt it to television using the art work of the children.

E. Arithmetic

1. Cost of gas used per mile.

2. Cost of food and transportation per child.

3. Number of plants and animals seen.

a. Number of birds

b. Number of wild flowers

c. Number of cedar trees

d. Number of frogs

IV. Our Sources of Information

A. Films and Filmstrips We Want to See:

16MM Films

Ants

Birds in the Countryside

Birds of the Dooryard

Camouflage in Nature Through Form and Color Matching

Camouflage in Nature Through Pattern Matching

Common Animals of the Woods

Five Colorful Birds

How Animals Defend Themselves

How Animals Eat

How Animals Move

Seasonal Changes in Trees

Snakes

Spring on the Farm

Wonders in a Country Stream

Wonders in Your Own Backyard

Everyman's Empire

Filmstrips

Some Wild Flowers

Telling Trees Apart

Birds' Nests

B. Our Library Books We Want to Read:

1. What Flower Is It?
2. What Bird Is It?
3. What Butterfly Is It?
4. Wild Flowers
5. Woodland Flowers
6. Blue Book of Trees
7. Red Book of Trees
8. Water Appears and Disappears
9. Animals and Other Young
10. Six-Legged Neighbors
11. How The Sun Helps Us
12. Useful Plants and Animals

13. Animals Around the Year

14. Plants Around the Year

15. Birds in Your Backyard

16. Birds in the Woods

17. The Insect Parade

18. Leaves

19. A Year In a City

20. The Magnificent Mr. Toad

21. Life In An Ant Hill

Experience Charts By The First Grade[3]

After the visit to the nature trail the children recorded their experiences. It is doubtful that tadpoles were observed in late fall, but if the child said tadpoles - tadpoles they were. The ability to talk, organize, record, and draw was required to present the story. For details of the experience charts show slides number 57-68. No script is required since the slides are self-explanatory. Photographs for the end paper of this thesis shows the experience charts in the classroom.

Visual Art

Experience is the true essential of children's art. The vivid contacts of a child's immediate surroundings give rise to the best art work. The child may draw it before he can tell it.

Every child gave his expression of the nature trail experience by a drawing or a painting. Slides selected from the first and fifth

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3. Mrs. Edith Settan's First Grade, Caldwell School, Greensboro Public Schools, Greensboro, North Carolina.

grades are presented.

Slide No. 69 - Golden Garden Spider

Many beautiful spiders had built their webs across the trail. This is the impression of one child in Mrs. Emma Nelson's Fifth Grade Class at Lindley Elementary School.

Slide No. 70 - Annular Rings

The ages of trees were stressed by counting the annular rings. The log is the center of interest for this child. (Fifth grade, Lindley Elementary)

Slide No. 71 - Fungus on Log

The breaking down of dead vegetation by fungus to make woodland soil is the chief objective in this picture.

Slide No. 72 - A Tree and Dale Keller

A first grader's impression of the trail. A tree and fat person with a bald head.

Dramatics and Radio

Children are born actors. By the proper guidance of the teacher a play is put together from the common experience of the group. In practically all the plays, the children write an original song. They like to tell their story in song and rhythm. It takes a lot of talking, listening, reading, and writing to organize a script for a play. All facts must be accurate. Children are their severest critics. After the script has been completed, parts assigned (every child must have a part), the play is given as an assembly program. To prepare for radio, additional sound effects and changes in script must be made. Recordings are made of the programs. After hearing

themselves, most children are quick to catch mistakes and correct them. At last the day for broadcast has come. The children are at the station. The director points - you are on the air! A first grader takes charge as the announcer. Another dynamic adventure with children has started. The entire procedure has been a learning experience for the children.

"The Garden Spider", a radio script written by the second grades at Ceasar Cone School, is typical of the primary science program. Names to primary children (parents too) are important. Note the repetition.

THE COMMON GARDEN SPIDER[4]

Introduction:

Suzanne:

This is Suzanne Anderson. We are boys and girls in the second grade at Ceasar Cone School. Some of us brought common garden spiders into our classrooms this fall. The ones who brought them were:

Burwell Cockman

Jesse Gray

Frankie Sue Poe

Bobby McCaskill

Richard Pridemore

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4. Beautiful, golden spiders spun their webs across the nature trail. The children were interested in spiders, but were frightened of them due to misinformation given by parents and teachers. Most parents and teachers think of snakes and spiders as being dangerous. Two second-grade teachers at the Ceasar Cone School asked the children to bring these spiders to school as a part of their science materials. The outcome was a very helpful radio program in primary science.

Frankie Starling

Betty Leonard

We watched our spiders to see what they would do. They made egg sacs and laid eggs. One spider didn't finish her egg sac and the eggs fell out. We watched our spiders and read about them. Now we are going to have a quiz program about the things we learned.

(Each Child Answers One Question; Then Asks The Next)

Suzanne:

Larry Leonard, how does a common garden spider look?

Larry Leonard:

She looks like black and gold velvet. Michael Sam, is she our friend?

Michael Sam:

Yes, she is our friend because she eats the insects in our gardens. Frankie Sue Poe, how many eyes does she have?

Frankie Sue Poe:

She has eight eyes. Burwell Cockmon, how many legs does she have?

Burwell Cockman:

She has eight legs. Bobby McCaskill, how many parts does her body have?

Bobby McCaskill:

Her body has two parts - one big part and one little part. Sidney Harris, which part of the body has the eyes?

Sidney Harris:

The small part of the body has the eyes. Becky Tidwell, which part of the body has the legs coming from it?

Becky Tidwell:

The small part has the legs coming from it. Brenda Shelton, does the silk come from the small part or the large part of her body?

Brenda Shelton:

The silk comes from the large part. Carl Pegram, do the eggs come from the small part or the large part of her body?

Carl Pegram:

The eggs come from the large part. Joyce Woodell, does she breathe in the big part or the little part of her body?

Joyce Woodell:

She breathes in the big part. Jimmy Diamiaco, how does she squeeze the silk out of her body?

Jimmy Diamiaco:

She squeezes it out with her hind legs just as we squeeze tooth paste out of a tube. Jessie Gray, how does she lay her eggs?

Jessie Gray:

She makes a silk sheet and lays her eggs on it. Then she draws it up into a sac. Martha Coble, about how many eggs are in one sac?

Martha Coble:

There are about 500 eggs in one sac. Janice Vaughn, do the rain and snow hurt the eggs in the sac?

Janice Vaughn:

No, because it is waterproof. Richard Pridemore, where does the mother spider put her egg sac?

Richard Pridemore:

She hangs it on a dead weed. Kelly Pinkleton, what do the baby spiders do to each other in the egg sac?

Kelly Pinkleton:

They eat each other. The strong ones eat the weak ones. Mary Lou Kiser, how long do the spiders stay in the egg sac?

Mary Lou Kiser:

They stay all winter. Billy Trollinger, how do the spiders get out of the sac?

Billy Trollinger:

They crawl out at the top. Faye Meadows, how do the grown spiders get food?

Faye Meadows:

They spin a web. One part is sticky. The insect gets caught in the sticky part. Frankie Starling, what does the mother spider do with an insect after she has caught it?

Frankie Starling:

She poisons it so that it cannot move. Then she wraps silk thread around it. If she is hungry she eats it. If she is not hungry she hangs it up in her web until she gets hungry. Ann Kapps, what part of the insect does mother spider eat?

Ann Kapps:

She eats the soft or juicy part away. Sometimes father spider eats the hard part. Roger Williamson, what does the mother spider do after she has eaten the insect?

Roger Williamson:

She cuts the insect out of her web. Then she must mend her web. Sandra Smith, which is bigger, mother spider or father spider?

Sandra Smith:

Mother Spider is bigger than father spider. Carol Cox, what happens to father spider soon after he comes to mother spider's web?

Carol Cox:

Mother spider eats father spider. Linda Johnson, how does mother spider come from her web?

Linda Johnson:

She grows too big for her clothes. Then she crawls out and grows new clothes. Gerald Crum, when does mother spider die?

Gerald Crum:

When she gives out of silk.

Suzanne Anderson:

We are going to sing "Eency, Weency, Spider." Then we are going to have the rhythm band with it. (This song is from the "First Grade Book" by Lilla Belle Pitts, Mabell Glenn, and Lorrain E. Walters, published by Ginn and Company).

All Sing:

EENCY, WEENCY, SPIDER

Eency, weency spider went up the water spout,
(Fingers pretend to be a spider climbing a spout)

Down came the rain and washed the spider out.
(Hands fall, palms down-palms out, sweep arms upward)

Then came the sun and dried up all the rain,
(Arms overhead, fingers touching)

And the eency, weency spider went up the spout again.
(Hands fall down and fingers climb spout again)

Suzanne Anderson:

This is the end of our program.

Radio Script Adapted For Television

The second grade of McIver School produced a script on seeds. It was presented as a radio program and then adapted to television. The script is presented as an example of adaptation of a radio script to television. Brackets indicate special television script.

OUR SEED COLLECTION[5]

Frances Ann:

I am Frances Ann Gray in the Second Grade of McIver School. Miss Wagoner is my teacher.

We have been doing some interesting things in science this fall. We want to tell you about our seed collection. This is the time of the year for seeds. You see them on many trees, shrubs, and plants. The mother plant doesn't want all her seeds to fall down around her feet, for if they did her babies would not have room enough to grow, so she sends them on their way. Some steal a ride on animals or people; some sail through the air; the water carries some away, and some pay for their ride by giving us something to eat, like the apple or peach. Linda, will you tell about the seed you added to our collection?

---

5. Television Show Presented by Miss Annie Wagoner's Second Grade of the Charles D. McIver School, Greensboro Public Schools, Greensboro, North Carolina. Brackets indicate adaptation to television.

Linda:

Mother put a peach in my lunch one day. I saved the seed. It paid me for its ride. [(Holds up seed) This is the peach seed I saved.]

Frances Ann:

Early this fall Miss Wagoner took us for a walk. We found a tree with little burrs on it. In the burrs were nuts. It was a beech tree. One of our boys said he wished that beech-nut chewing gum was growing on the tree instead of nuts. We have beech-nuts now in our collection. [(Judy Loy, will you show the seeds from the beech tree?)]

[Judy:

Here are the seeds from the beech tree. See the burrs - see the nuts will fall out.]

Frances Ann:

On the field we found some vines. Eddie House, will tell what they are.

Eddie:

They were morning glories, and the seed pods just popped open when we touched them. Little black seeds fell out in our hands. We took some with us for our collection. [(Shows Seeds) Here are some seeds.]

Frances Ann:

Mr. Gray Squirrel could find plenty of acorns to put away for winter from the oak trees on our nature trail. We filled our pockets with the acorns. In the song we are going to sing, you will see how squirrels help to scatter seeds. (Sing "Squirrel's

Secret" p. 98-Tuning Up, published by Ginn and Company)

THE SQUIRREL'S SECRET

"Why are your cheeks so fat?
Please, squirrel, tell me that.
Now don't hurry up the tree,
Till you have answered me."

He twinkled beady eyes,
Then to my great surprise,
From his mouth there tumbled down
Five nuts all smooth and brown.

Frances Ann:

Donna Bailey, show us some acorns from the oak tree.

Donna:

This is a twig from an oak tree. See the acorns.

Frances Ann:

We had a picture on our bulletin board about some squirrels eating peanuts. Some of our boys and girls thought that peanuts grew on trees like acorns. Jack Green, tell about the peanuts you brought.

Jack:

I brought a peanut vine to school with peanuts hanging on it. (Shows peanut vine.) We have peanuts growing in our garden. Peanuts grow on vines, not trees.

Frances Ann:

Gloria Griffin, will you please tell about your seeds?

Gloria:

I brought some maple seeds. They look like airplane wings. One of our boys, Ronnie Bradley, calls them little helicopters! We found lots of maple trees just full of seeds. It's fun to sail them in the air. [(Throws a handful of maple seeds up in the air.) Here is a cluster of seeds from the maple tree.]

Frances Ann:

Clifford Wren, what seeds did you find on the nature trail?

Clifford:

I brought them on me. They were beggar ticks. I got them on my pants legs as I walked around the field. I picked them off and put them in one of our little glass jars for our collection. [Here are some beggar ticks - (Shows seeds)]

Frances Ann:

We have a riddle for you. Can you guess it?

All:

As white as milk,
As soft as silk,
And hundreds close together,
They sail away,
On an autumn day,
When windy is the weather.

Frances Ann:

Do you know the answer? Shall we tell them, boys and girls?

All:

Milkweed seeds.

Frances Ann:

We had fun playing with some milkweed pods that Miss Wagoner found. We opened them up and they blew away. They went sailing away like little parachutes. We learned a cute poem, "Milkweed Babies." We will say it for you. [Jimmy Wilson will show some milkweed pods.]

[Jimmy:

Here are some milkweed pods, the pods are open and some of the seeds have sailed away. (Hold one up and blows it) - See it floats like a little parachute. (Throws up a handful and children blow them).]

All:

MILKWEED BABIES

There was an old woman
Who lived in a shoe
I've heard all about her
I know you have too.

There's another old woman
I'll tell you about.
She keeps all her babies
Where none could get out.

Their nursery room
Was a milkweed pod green;
The children were crowded
All betwixt and between!

One day Mrs. Milkweed
Just opened the door,
And out flew the babies
To come back no more!

-Agnes Wonson

Frances Ann:

Sylvia Robinson, where did you get the seeds you brought?

Sylvia:

In my mother's garden. They were cockle burrs. It is too bad when they get in a dog's hair. You have to get them out for the poor dog. They are bad weeds and we do not like them. [(Puts one on front of dress.) See how they will stick on you.]

Frances Ann:

Mary Virginia Freeman, tell about the dandelions we found the day we took our walk.

Mary Virginia:

Some were yellow and some had gone to seed. Those that were white looked as if they had white hair on their heads. We played seeing if our mothers wanted us. You do it like this: You take one big blow. (Blows a dandelion.) If you blow all the seeds off, your mother doesn't want you. If some seeds are left, you had better hurry home to see what your mother wants.

Frances Ann:

We love this song about the dandelion. We will sing it for you.

(All sing "Dandelion Parachutes" p. 94 - New Music Horizons published by Silver Burdett Company)

DANDELION PARACHUTES

Here is a dandelion white as the snow,
Pick it up gently, hold and blow,
See the seeds scatter and sail through the air,
Landing so softly here and there.

There goes an aeroplane sailing up high,
Carrying soldiers through the sky;
Paratroops sometimes will jump to the ground,
Parachutes land them safe and sound.

Frances Ann:

What about the seeds you found for our collection, Ronnie Bradley?

Ronnie:

I found some tumble weeds. They go tumbling along when the wind blows them, and that's the way the seeds get scattered. [See them tumble!]

Frances Ann:

We had a race. Miss Wagoner timed us and we tried to see how many different kinds of seeds we could find in ten minutes. I will let the winners, Terry Stewart and Jerry Gordon, tell you about it.

Terry

I was the winner. I got ten different kinds of seeds. I was out of breath, but I am glad I won.

(All sing "Dandelion Parachutes" p. 94 - New Music Horizons published by Silver Burdett Company)

DANDELION PARACHUTES

Here is a dandelion white as the snow,
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Carrying soldiers through the sky;
Paratroops sometimes will jump to the ground,
Parachutes land them safe and sound.

Frances Ann:

What about the seeds you found for our collection, Ronnie Bradley?

Ronnie:

I found some tumble weeds. They go tumbling along when the wind blows them, and that's the way the seeds get scattered. [See them tumble!]

Frances Ann:

We had a race. Miss Wagoner timed us and we tried to see how many different kinds of seeds we could find in ten minutes. I will let the winners, Terry Stewart and Jerry Gordon, tell you about it.

Terry

I was the winner. I got ten different kinds of seeds. I was out of breath, but I am glad I won.

Jerry:

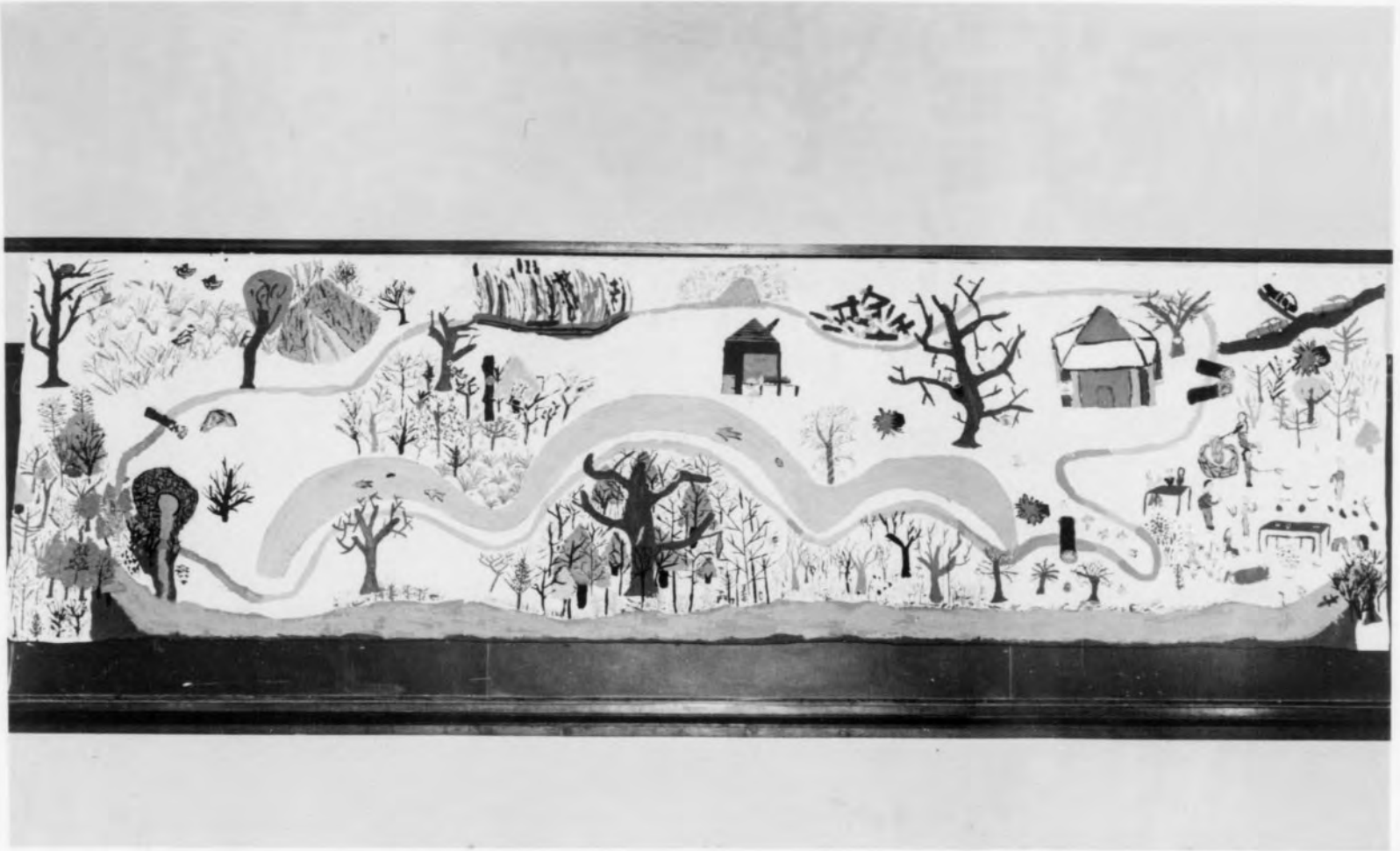
I was next. I found nine different kinds. I had to work fast, too.

Frances Ann:

We enjoyed collecting seeds. We have thirty-three different kinds in our collection. We have them in little baby food jars, and all of them are labelled. Holds up one. Come to see us sometime, and we will tell you more about our seeds.

Television

The most dynamic medium of communication is television. The fifth grade of Lindley Elementary School painted a mural of the Franklin McNutt Nature Trail. The class decided it would make an interesting television program. As a result of the nature trail experience the children searched for scientific facts to confirm their observations. The television script is an outgrowth of their combined experiences. The narration was given by members of the class. Slides number 73-77 show the mural. The script, "Franklin McNutt Nature Trail", is presented without change.



THE FRANKLIN MCNUTT NATURE TRAIL[6]

Introduction: Slide No. 73

Peggy:

(Points of interest indicated on the mural as the children speak.) Our class spent one happy day at Dr. McNutt's farm. We are going to take you on a trip around the nature trail. We will start at the old tobacco barn which was once used for curing tobacco. After leaving the tobacco barn we came to a saw mill. Near it is a saw dust pile and many logs.

Paula:

(Slide No. 74)

From the logs we learned how to tell the age of a tree. Every year the tree increases in girth (around in meaning), by adding tissue or sap-conveying wood just outside last year's wood, and just inside the bark. In temperate climates each year's ring usually remains so distinct that the age of the tree may be estimated by counting the rings. By the varying thickness of the rings the tree ring calendars also reveal or tell the wet and dry years through which the tree has lived.

Peggy:

Around the saw dust pile is a broom sedge field where only small pines can grow. The broom sedge field gets its name because it has growing in it a straw-like weed that looks like and can be used in making brooms.

---

6. A television program presented by members of the Fifth Grade Class, Lindley Elementary School, Greensboro Public Schools, Mrs. Emma Nelson, teacher.

Susan:

Look at the plants and weeds and cattails. Cattails are plants that grow in swamps and marshes. There are two kinds - the large cattail which has broad leaves and the smaller which has narrow leaves. The larger one grows to a height of five to six feet. On the Pacific Coast they are called tule reeds. We saw reeds and rushes. These are the common names for tall, slender grass plants. They can be as fragile as a straw or as thick as bamboo.

Paula:

Here we saw a good example of soil erosion. The wearing away of earth or rock is called erosion. It works slowly but surely. In hundreds of thousands of years erosion can wear away a mountain until it is level with the plain. The surface of the earth is always being changed and modified by erosion. The main causes of erosion are the actions of air and water, and changes in temperature. Rainfall, running water, waves, ice and wind-all help to wear away earth and rock.

Susan:

(Slide No. 75)

Look at the dogwood. Dogwood is a common name for a group of trees or shrubs. Out here the best known dogwood is the flowering dogwood. In North America there are eight different kinds. Here we saw the bright red fruit or drupes which appear in the autumn. The bark of a dogwood is like the hide of an alligator. The wood of the flowering dogwood is hard and heavy.

Janet:

The Praying Mantis is kin to the grasshopper and the cricket.

It is a murderer and cannibal. Inside the arms are sharp cruel claws, and the head, cocked now to the right, now to the left, holds two large eyes always on the lookout for unwary victims. The Mantis is found in the southern United States and Europe, and in nearly all tropical countries. The commonest American species, called the "rear-horse" or "mule killer" is of a leaf-green color, and hides in trees and grass. The eggs are laid in tough cases attached to twigs.

We saw a squirrel's nest. It was a summer nest. In winter the squirrels stay in hollows where they store their food.

The pea field was to attract the quail. The quail eat the peas. We did not see the quail because the peas were so thick. They were a brownish gray color. The peas were dried up.

Carol:

Our trail crossed a little stream near the spring. This spring has rocks around it, and along the edges grow moss and ferns. When ground water, which has accumulated in porous rocks and soil, seeps through a natural opening we call it a spring. These outlets may occur in a valley or on a hillside.

Peggy:

We saw many creatures such as frogs, salamanders, lizards, and snakes. One type of snake we saw was the King Snake. He is powerful creature from four to five feet long, marked with a striking pattem of yellow or white bands. The King Snake is a hero among snakes, and whether it is a giant Rattle Snake or a tiny Copperhead the King Snake always wins. He coils himself around the other snake, and soon strangles it. If it is not too large he will eat it. The

King Snake is not at all brave, but he is immune to snake poison. Although the King Snake is dangerous to other snakes he is harmless to people. Another snake we saw was the Garter Snake. He is green in color and is around ten inches long.

The spiders interested me very much. The garden spider is one of the spiders we saw. It is black and yellow in color, and its web is very delicate and skillfully made. You can find such a web in almost any garden, and at Dr. McNutt's farm they were stretched across bushes or on trees.

Susan:

Lichens are flowerless plants. They grow on bare rocks and on tree stumps. Throughout the world they grow in the cold regions and in the tropics, on beaches as well as on mountain tops. About 4000 kinds of lichens are known. They have no roots, stems, or leaves. Lichens are useful, because, in time, they make it possible for other plants to grow in remote places. This happens because lichens produce an acid which dissolves the rocks and softens the soil. As they decay and mix with the soil, the soil becomes richer and more able to support other plant life.

Paula:

Out at the farm there are many damp, dark places. Since mushrooms like damp, dark places, many of them grow out there. There are red, white, yellow, and orange mushrooms, but there are no green ones. No matter what their color all mushrooms are alike in one way. Not one can get its own food. If you dig down into the ground where the mushrooms are you will probably find some rotting wood. The mushrooms use this dead plant material as food. They

must do this, because they have no chlorophyll. Spores are on the underside. When the spores are ripe they fall to the ground. When they have fallen new mushrooms are formed. Sometimes you can find mushrooms that are good to eat. But mostly you will find deadly poisonous mushrooms. The ones you eat should be bought in a store.

Carol:

Here is the Ox Bow lake. As its name signifies, it is shaped like an ox bow. This lake is formed by water draining from the hill sides, and by some wet weather springs.

Janet:

We saw several kinds of birds and bird nests. Some of the birds were robins, wrens, bluebirds, and cardinals. On the trees were labels of the kind of birds found in this forest. Some had pictures of robins. We saw a bird nest. It was right here. It was made of twigs and mud.

Susan:

You know that lizards are the closest living relatives of snakes. Some lizards look just like snakes. Some look like crocodiles. They may be all sizes and colors. Here we saw salamanders too. They are sometimes called spring lizards or wood lizards. Salamanders are related to frogs. They have moist skins and no scales. In Japan there are salamanders five feet long that lay eggs the size of grapes. We saw a spotted salamander. They eat snails, slugs, worms, and insects.

Carol:

(Slide No. 76)

In one curve of the Ox Bow Lake is a fern garden. Ferns

Peggy:

I found this mud-dauber's nest while I was at Dr. McNutt's farm. Mud-daubers' nests have little cup-shaped cells. They plaster them over the sides of buildings or on stones. Then they stamp down the earth with a pebble which they hold in their jaw. The mud-dauber is the only insect that uses a tool. Before the mud-dauber lays her eggs she places a grasshopper in front of a cell, so when the young daubers hatch they will find food ready for them. The mud-dauber is related to the wasp family, and as you know, the wasp's sting is powerful. The mud-dauber's sting is just as bad.

Janet:

(Slide No. 74)

When we were planning the nature trail trip we decided to carry our lunch along. We made our menu, and a grocery list. We figured that each child should have two hot dogs. We also figured the total cost per child. We had fun eating hot dogs, pickles, carrots, onions, slaw, pepsi cola, and doughnuts. While we were eating hot dogs Mr. Keller took pictures of us, and made them into slides.

Peggy:

Now we will come back to the tobacco barn which is being cleared out so it can be made into a rest room and a first aid station for the people who come to Dr. McNutt's farm. They now have a first aid sign on a box which is beside the tobacco barn. Then we piled into the cars with the grade mothers, and headed for Lindley Elementary.

(Show Slide No. 77)

CONCLUSION

As a result of this study, the following conclusions can be drawn with a considerable degree of confidence:

1. The primary objective of the nature trail, the demonstration of the balance in nature, may be accomplished without regard to seasons.

2. Soil and water conservation measures are demonstrated without regard to seasons.

3. Seasonal changes in plants and animals may be observed.

4. The nature trail experience helps the children to be more scientific in their attitudes and to develop a greater appreciation of the interrelationship of plants and animals.

5. The nature trail is stimulating in its appearance and satisfying in its results as demonstrated by increased activity in the language arts, painting, music, drama, radio, and television.

6. It helps children to organize, share, and evaluate information.

7. It teaches proper courtesy and safety practices in groups outdoors.

8. It cultivates keen observation.

RECOMMENDATIONS

On the basis of this study, the following recommendations are made:

1. The Franklin McNutt Nature Trail should be an integral part of the elementary science program in this area.

2. The trail is concerned with a broad understanding of the balance in nature and not the memorization of the countless names of plants and animals.

3. In-service training courses and workshops in elementary science should be offered.

4. Signs should be made by the children and added to the trail each year.

5. Adequate supervision and care of the trail and facilities must be maintained.

6. Take the parents with you on the trip. Select people who enjoy the outdoors. This is one method of building good public relations for schools.

7. Three trips to the nature trail can be made advantageous each school year.

8. Postpone the trip if adequate preparations have not been made.

APPENDICES

APPENDIX A

CRITERIA FOR A NATURE TRAIL FOR ELEMENTARY CHILDREN

Nature trails for elementary children will require standards in addition to those used by camps and parks. Elementary teachers will not be as well prepared for this type work as an experienced naturalist in charge of the trails at camps and parks. The additional care of children will also take the attention of the teachers. Therefore, the trail should have as many conveniences as possible to help the teacher and her group to enjoy this exploration. With this in mind, criteria for such trails should be formulated.

As a member of the Criteria Committee, please delete by marking through, or add by writing in, items which would be of value in the general areas listed below:

1. Acessibility
   a. The location must be far enough away from the metropolitan area to have all the flora and fauna in its natural habitat but within commuting distance of the classroom.
   b. All-weather roads are essential.
   c. The location must be easily found.
   d. A long term permission from the owner should be obtained.
2. Facilities
   a. If the location is used often, toilets which meet the sanitation regulations of the local health department must be provided.
   b. Drinking water should be available. If a spring is used,

it should be covered to prevent contamination. The water must be tested regularly.

c. A shelter will be helpful as a classroom, for storage of equipment, and for protection during inclement weather.

d. A well-supplied first-aid cabinet and stretcher should be located at the shelter. Simple first-aid instructions must be posted in or near the first-aid cabinet.

e. Parking space must be adequate and safe.

f. A picnic area with tables and provision for cooking is desirable.

3. The Nature Trail

a. The trail should be made wide enough to allow the group to walk double file. At the points of interest (signs or numbers), there should be a space large enough for the entire group to stand around the teacher.

b. Children under the guidance of the non-specialized naturalist will need additional signs.

c. Rest stations should be located at frequent intervals to give the class an opportunity to observe and listen.

d. Typical flora and fauna of Piedmont North Carolina should be present.

e. Typical rock formations would be desirable.

f. A variety of plants must be adjacent to the path.

g. A brook supporting animal and plant life is highly desirable.

h. The trail should not be over one mile in length and should end in the vicinity of its beginning. The path should

include cleared ground, forest, streams or lakes. The walker should not have to retrace his steps.

The Criteria Committee was composed of the following:

1. Mrs. Nellie D. Blackburn, Head of the Science Department, Senior High School, Greensboro, North Carolina.
2. Dr. Edgar Dale, Professor of Education, Head of the Curriculum Laboratory, Ohio State University, Columbus, Ohio.
3. Dr. Karen Carlson, Registrar, Woman's College, University of North Carolina, Greensboro, North Carolina.
4. Miss Ruth Gunter, Assistant Professor of Education, Curry School, Woman's College, University of North Carolina, Greensboro, North Carolina.
5. Mrs. Mary A. Hunter, Instructor, Curry School, Woman's College, University of North Carolina, Greensboro, North Carolina.
6. Dr. Eugenia Hunter, Associate Professor of Education, Curry School, Woman's College, University of North Carolina, Greensboro, North Carolina.
7. Mr. Charles Milner, Associate Director of the Extension Division, University of North Carolina, Chapel Hill, North Carolina.
8. Miss Ethel McNairy, Principal of Lindley Elementary School, Greensboro Public Schools, Greensboro, North Carolina.
9. Dr. Franklin H. McNutt, Associate Dean of the Graduate School, University of North Carolina, Woman's College Division, Greensboro, North Carolina.

10. Mrs. Emma Nelson, Fifth-Grade Teacher, Lindley Elementary School, Greensboro, North Carolina.
11. Dr. John S. Richardson, Associate Professor of Education, Ohio State University, Columbus, Ohio.
12. Dr. Hollis J. Rogers, Professor of Botany, Woman's College, University of North Carolina, Greensboro, North Carolina.
13. Dr. Archie D. Shaftesbury, Professor of Zoology, Woman's College, University of North Carolina, Greensboro, North Carolina.
14. Mrs. Edith Settan, First-Grade Teacher, Caldwell School, Greensboro Public Schools, Greensboro, North Carolina.
15. Mr. B. L. Smith, Superintendent of Greensboro Public Schools, Greensboro, North Carolina.
16. Mrs. Margaret Y. Wall, Principal of Caldwell School, Greensboro Public Schools, Greensboro, North Carolina.
17. Dr. Richard Weaver, Program Director of Resource-Use Education, State Department of Public Instruction, Raleigh, North Carolina.

APPENDIX B

TRANSACTIONS CONCERNING THE NATURE TRAIL

November 22, 1950

Dr. Franklin McNutt
Woman's College of the
University of North Carolina
Greensboro, North Carolina

Dear Dr. McNutt:

The Board of Trustees of the Greensboro City Administrative Unit asked me to convey to you their sincere appreciation of your offer to allow the use of your property off the McConnell Road for nature study purposes by pupils of the Greensboro Public Schools. An effort is being made to arrange for the sanitary facilities, and it is hoped that your kind offer may be accepted, and that extensive use may be made of the facilities for the acquiring of elementary scientific knowledge.

With personal regards and esteem, I am,

Yours cordially,

B. L. Smith

Superintendent, Greensboro Public Schools

CC: Mr. D. E. Hudgins
Mr. Dale F. Keller

(Copy of the Original Letter)

The following article appeared in the Greensboro News-Record the week of March 1, 1951.

CITY TO RENT LAND TO HOLD WILDLIFE CLASS

A 10-acre tract of land will be leased to the city school system for use in studying wildlife and nature, B. L. Smith, superintendent of city schools, announced today.

The land, a wooded tract located off McConnell Road, is the property of Dr. and Mrs. Franklin McNutt. Smith said it is being leased to the school system for 10 years at no cost.

Dr. McNutt teaches at Woman's College and is associate dean of the graduate school of the University of North Carolina.

Tim Warner, publicity director of the local Junior Chamber of Commerce, announced that the Jaycees have already presented the school system with $135 to help with maintenance of the land. Further donations are scheduled to come from proceeds of the Jaycee-sponsored Greater Greensboro golf tournament, Warner said.

Smith stated that the land, which contains virgin timber, will be used to teach water and soil conservation and will constitute a "living textbook" for further study of natural subjects. The land is a wildlife refuge.

Formal signing of the lease is expected to take place within the next few days, Dr. McNutt said.

March 21, 1951

Dr. and Mrs. Franklin H. McNutt
Woman's College of the
University of North Carolina
Greensboro, North Carolina

Dear Dr. and Mrs. McNutt:

I am sending you herewith the executed lease between yourselves and the Board of Trustees of the Greensboro City Administrative School Unit.

I am personally very happy over this cooperative endeavor, and I hope that it proves to be immensely valuable to the pupils of the Greensboro Schools. I trust also that you will find genuine satisfaction in the magnificant generosity you have exhibited in allowing use of your property for this educational and recreational project.

Yours cordially,

B. L. Smith

Superintendent, Greensboro Public Schools

Enclosure

CC: Mr. D. E. Hudgins
Mr. Dale Keller

(Copy of the Original Letter)

STATE OF NORTH CAROLINA

GUILFORD COUNTY

THIS LEASE,

Made this the 20th day of March, 1951, by FRANKLIN H. MCNUTT and wife, FRIEDA G. MCNUTT, of Guilford County, North Carolina, hereinafter sometimes called the Owners, to THE BOARD OF TRUSTEES OF THE GREENSBORO CITY ADMINISTRATIVE UNIT, a body politic and corporate created by act of the 1949 General Assembly, hereinafter sometimes called the Tenant,

WITNESSETH THAT:

The Owners hereby demise and let, and the tenant hereby hires and rents, a tract of land belonging to the Owners which is situated in Guilford County, North Carolina, and which is described as follows:

> BEGINNING at the northeast corner of the intersection of Guilford County Road No. 5182 and the land or road to a sawmill, and running thence north along Guilford County Road No. 5182 to the edge of the timber on the north bank of a stream; thence east following the timber line to the corner of the Ross Phipps-McNutt line; thence south to the road or lane to the sawmill; thence west to the point of beginning; together with an easement for ingress, egress, and regress over the property of the Owners from Guilford County Road No. 5182 to the parking areas and the shelter on the tract of land described above; this lease being subject to the provision that the log tobacco barn situated on this tract of land may be used jointly by the Owners and the Tenant and that the other tobacco barn thereon is reserved for the exclusive use of the Owners.

TO HAVE AND TO HOLD said premises, together with the privileges and appurtenances thereunto belonging to the Tenant for the Term and upon the conditions hereinafter set out.

FIRST. Term; termination upon notice. The term of this lease shall be ten years from the date hereof; but either the Owners or the Tenant may terminate this lease at any time upon thirty days notice to the other.

SECOND. Rent. The Tenant agrees to pay the Owners as rent for the leased premises the sum of One Dollar ($1.00) a year, payable in advance.

THIRD. Use of leased premises. This lease is made to the Tenant in order that the leased premises may be used by the pupils of the Greensboro Public Schools as nature trails and for nature study.

FOURTH. Toilet and water facilities. The Tenant agrees that it will, by means of donations which may be made for that purpose, maintain adequate toilet and water facilities on the leased premises, it being understood, however, that no water line is available and that such water facilities shall be only such as may be available from springs or otherwise on the premises, water from such sources to be used only when it meets proper standards for purity.

In Witness Whereof, the Owners have signed and sealed this lease and the Tenant has caused it to be signed in its corporate name, attested, and sealed with its corporate seal, all done by its duly authorized officers in duplicate as of the date hereof.

_____(SEAL)
(Franklin H. McNutt)

_____(SEAL)
(Frieda G. McNutt)

THE BOARD OF TRUSTEES OF THE GREENSBORO CITY ADMINISTRATIVE UNIT

ATTEST:

_____ By _____
Secretary Chairman

(Exact Copy of Original)

APPENDIX C

ORGANIZATIONS AND AGENCIES CONCERNED WITH ELEMENTARY SCIENCE

This list of organizations and agencies has been prepared with special emphasis on teaching materials for the nature trail on the elementary level.

1. Federal Security Agency, U. S. Office of Education. Washington 25, D. C.

   Curriculum Content in Conservation for Elementary Schools (1940, 79p., 15¢.)
   Better Living Through Wise Use of Resources. (Bulletin 1950, No. 15.)

2. U. S. Department of Agriculture, Forest Service and Soil Conservation Service, Washington 25, D. C.

   Bulletins, films, and transcriptions are available on request. Write for latest list.

3. Wildlife Resources Commission, Department of Conservation and Development, Raleigh, N. C.

   Consultants, films, bulletins are available on request.

4. Resource-Use Education, State Department of Public Instruction, Raleigh, N. C.

   Consultants and teaching materials available on request.

5. National Audubon Society, 100 Fifth Avenue, New York 28, New York.

   Films, charts, and bulletins are available for teaching conservation of soil, water, plants, and wildlife.

6. Local Scout Chapters, Boy and Girl Scouts will have materials which will prove helpful on the Nature Trail.

7. National Education Association, 120 116th Street, N.W., Washington 6, D. C.

   Yearbooks and bulletins are available on elementary sciences and conservation.

8. National Wildlife Federation, 3308 14th Street, N. W., Washington, D. C.

9. Local Red Cross Chapters.

10. Local Farm Agents or Forest Wardens.

APPENDIX D

SUPPLEMENTARY REFERENCES

References for Children in the Intermediate Grades.

The materials selected are generally appropriate for use in the upper grades of the elementary school. Much of the material can be used above and below the intermediate level.

1. Caldwell, John C.; Bailey, James L.; and Watkins, Richard W. Our Land and Our Living. Syracuse, New York: L. W. Singer Company, 1941. 301 p. 72¢.

   Simplified information about the conservation of soil, water, forest, minerals, and wildlife. Suggests many pupil activities, including outdoor projects.

2. Charles E. Merrill Company-Little Wonder Books. Columbus, Ohio: the Company. Set of 90 in metal case, $14.50. Each booklet 15¢.

   Selected titles are:

   No. 104 Story of Seeds
   No. 105 Animal Families
   No. 107 Pets
   No. 201 Early Man and Animals
   No. 204 Plants That Give Us Food
   No. 207 Where Animals Live
   No. 213 Life on the Farm
   No. 301 Our Food
   No. 302 Our Clothing
   No. 303 Our Shelter
   No. 407 Trees
   No. 410 Color Protection
   No. 501 Our Land of Plenty
   No. 512 Balance in Nature
   No. 514 Early Life on Earth
   No. 615 The Earth
   No. 607 Lumber

3. Deusing, Murl. Soil, Water, and Man. Evanston, Illinois: Row, Peterson and Company, 1941. 47 p. 36¢. Illustrated.

Points out the relation of soil and water to man's well-being and deals with the esential elements in their conservation.

4. Fenton, Carroll L. Weejack and His Neighbors. New York: John Day Company, 1944. 128 p. $175. Illustrated.

Points out the relationships of plants and animals in a field and wood community. Conservation of plant and wildlife is incidental.

5. Fenton, Carroll L. Wild Folk at the Pond. New York: John Day Company, 1948. 128 p. $2.00. Illustrated.

Points out the relationships of plants and animals in a pond community. Conservation of wildlife is mentioned incidentally. The book is written in interesting style.

6. Fenton, Carroll L., and Fenton, Mildred A. Land We Live On. New York: Doubleday, Doran and Company, 1944. 89 p. $2.50.

Describes various types of land and tells how each was formed. Describes the formation of mountains, valleys, and rivers. Shows how water, either from rain or from streams, erodes the land and how to prevent this erosion. A full-page illustration accompanies each page of text.

7. Glover, Katherine. America's Minerals. Evanston, Illinois: Row, Peterson and Company, 1941. 57 p. 32¢. (See "Row, Peterson and Company" in this list of references.)

An introduction to the more common minerals and methods of identifying them.

8. Golver, Katherine. Our American Forests: Yesterday, Today, Tomorrow. Evanston, Illinois: Row, Peterson and Company, 1941. 48 p. 32¢. Illustrated.

Shows how forests are destroyed by overcutting, overgrazing, and fire. Explains how trees help to prevent floods, soil erosion, and depletion of water supply, as well as give multiple products for daily use.

9. Mason, George F. Animal Homes. New York: William Morrow and Company, 1947. 96 p. $2.00. Illustrated.

Different types of animal homes are described. Conservation of wildlife is discussed incidentally.

10. Melrose, Mary and Others. Nature's Bank: The Soil. Revised edition. Washington, D. C.: National Wildlife Federation, 1949. 48 p. 50¢ Illustrated in color. (The three booklets listed here and the one by the same author in "References for Children in the Primary Grades" can be purchased as a set, four booklets for $1.75.)

    Presents the elements of soil conservation and suggests many appropriate conservation activities for children.

11. Melrose, Mary, and Kambly, Paul E. Plants and Animals Live Together. Revised edition. Washington, D. C.: National Wildlife Federation, 1949. 32 p. 50¢. Illustrated.

    Gives children an insight into the unity of nature, showing how plants, animals, and man depend on one another.

12. Melrose, Mary, and Others. Raindrops and Muddy Rivers. Revised edition. Washington, D. C.: National Wildlife Federation, 1949. 32 p. 50¢. Illustrated in color.

    The relation of rain and running water to soil erosion is simply told, and the need for trees and other plant growth to hold the soil in place is emphasized.

13. Metcalfe, June M. Copper, The Red Metal. New York: Viking Press, 1944. 104 p. $2.00.

    A useful description of this basic mineral resource and its major uses.

14. Myers, John Walter. Ten Lessons in Forestry. New Orleans: Southern Pine Assocation, 1948. 56 p. Single copy free.

    Explains how trees grow. Shows how they affect the lives of people by the way they regulate soil erosion, climate, wildlife, recreation, and by the forest products they provide. Has a section on classroom projects and references for the teacher.

15. Parker, Bertha M. Plant and Animal Partnerships. Row, Peterson and Company, 1944. 46 p. 36¢. Illustrated in Color.

    Shows how different plants and animals depend on one another. A few of the relationships described are those

of bacteria and legumes in nitrogen manufacture; cherries and robins for food and seed distribution; and the pollination of flowers by bees. Other booklets in this series by the same author and publisher are:

Animals of the Seashore, 1942, 36 p., 36¢.
Animal Travels, 1941, 36 p., 36¢.
Balance in Nature, 1941, 36 p., 36¢.
Birds, 1941, 36 p., 36¢
Clouds, Rain, and Snow, 1941, 36 p., 36¢.
Earth: A Great Storehouse, 1941, 36 p., 36¢.
Earth's Changing Surface, 1942, 36 p., 36¢.
Saving Our Wildlife, 1944, 36 p., 36¢.
Soil, 1943, 36 p., 36¢.
Trees, 1941, 36 p., 36¢.
Water Supply, 1946, 36 p., 36¢.
Ways of the Weather, 1941, 36 p., 36¢.

16. Teale, Edwin W. Boys' Book of Insects. New York: E. P. Dutton Company, 1939, 237 p. $2.00.

Simply written stories about common insects, with numerous suggestions on how to collect and study them. Observation and photography are stressed.

17. Webber, Irma E. Anywhere in the World. New York: William R. Scott, 1947. 64 p. $1.50. Illustrated.

The story of the plant and animal adaption to the natural environment in which they live.

18. Whipple, Gertrude, and James, Preston E. Using Our Earth. New York: Macmillan Company, 1947 p. $2.20. Illustrated in color.

Describes changes in the land that have been made and are being made, such as making woodland into farm land. Explains the effects of these changes on tree cover, plants, animal life, soil, and waterways. Points out that some of the changes are bad but offers few suggestions for constructive action.

References for Children in the Primary Grades.

These references are generally suitable for children in the primary grades. Many of them may be used on a higher level, especially with children of limited background or retarded reading ability.

1. Allen, Durward L. The Farmer and Wildlife. Washington, D. C.: Wildlife Management Institute, 1949. 84 p. Free on request.

   A basic guide to proper land use for wildlife management. The illustrations are especially interesting to younger children.

2. Austin, Margot. Once Upon a Springtime. New York: Charles Scribner's Sons, 1940. 42 p. $1.00.

   Narratives of children's springtime discoveries of new life among flowers, birds, and animals.

3. Frasier, George W., and Others. Through The Year. Scientific Living Series. Syracuse, New York: L. W. Singer Company, 1948. Grade I. 128 p. $1.04.

   Conversational stories about plants, animals and other aspects of the natural environment designed for children in Grade I. Illustrated in colors. For later grades in primary division there are Winter Comes and Goes, Grade II; and The Seasons Pass, Grade III.

4. Melrose, Mary, and Kambly, Paul E. Would You Have Liked To Have Lived When? Revised edition. Washington, D. C.: National Wildlife Federation, 1949. 32 p. 50¢. Illustrated in color.

   In story form describes our resources when the first settlers came, shows how our land and forests have been wasted, and suggests things we can do to save what remains.

5. Norling, Josephine, and Norling, Ernest R. Pogo's Farm Adventure. New York: Henry Holt and Company, 1948. 46 p. $1.50.

   Farm adventures and conservation stories that emphasize the value of the soil.

6. Patch, Edith M., and Fenton, Carroll L. Prairie Neighbors. New York: Macmillan Company, 1940. 161 p. $1.75. Illustrated.

   Tells sixteen stories of the animals of the Central Plains region, showing the relationships of the animals discussed.

7. Patch, Edith M., and Fenton, Carroll L. Forest Neighbors. New York: Macmillan Company, 1938. 198 p. $1.75. Illustrated.

   Tells eighteen stories about the northwoods and its animals, showing the interrelationships of the animals discussed.

8. Patton, Lucia. The Little House on Stilts. Chicago: Albert Whitman and Company, 1948. 36 p. $1.50. Illustrated.

   An interesting example of the influence of the environment on ways of living.

9. Pease, Josephine Van Dolzen. This is the World. New York: E. M. Hale and Company, 1948. $1.92. Illustrated.

   Easy stories about land, water, air, climate, communication, and people.

10. Pistorius, Anna. What Bird Is It? Chicago: Wilcox and Follett, 1945. 24 p. $1.00.

    Pictures and describes 23 common birds.

11. Pistorius, Anna. What Butterfly Is It? Chicago: Wilcox and Follett Company, 1949. 25 p. $1.25. Illustrated in color.

    A children's guide to the ordinary species of butterflies.

12. Schneider, Herman, and Schneider, Nina. Let's Find Out. New York: William R. Scott, 1946. 38 p. $1.50. Illustrated.

    Questions and directions for simple experiments related to the daily environment.

APPENDIX E

MATERIALS FOR TEACHERS

These materials have been selected to give the elementary teacher the necessary science information for the nature trail at a nominal cost.

1. The Golden Nature Guides, published by Simon and Schuster, New York.

   These guides include books on birds, flowers, insects, trees, and mammals. The guides present plants and animals which beginners all over the country have the greatest chance of seeing. These guides are recommended for the teacher and the elementary student. (Price per guide $1.00). Correlated filmstrips are available.

2. My Land Your Land Conservation Series, published by the National Wildlife Federation, Inc. Washington, D. C. includes the following booklets: (Cost - free).

   Would You Like to Have Lived When? (Grades 4, 5, & 6).
   Raindrops and Muddy Rivers. (Grades 4, 5, & 6).
   Plants and Animals Live Together. (Grades 5, 6, & &).
   Nature's Bank - The Soil. (Grades 6, 7, & 8).

3. Blough, Glenn O. and Blackwood, Paul E. Teaching Elementary Science, Bulletin 1948, No. 4 Washington, D. C. Federal Security Agency, Superintendent of Documents, U. S. Printing Office, 1948. 40 p.

   The bulletin contains many valuable suggestions for the elementary teacher. Price 15¢.

4. The Random House one-dollar nature series are recommended for teacher and student. The following titles have been published:

   American Trees
   American Songbirds
   American Waterbirds
   American Butterflies and Moths

5. Singer Science News, published by the L. W. Singer Company, Inc. 249-259 West Erie Boulevard, Syracuse 2, New York.

   The Singer Science News is released each school month. Valuable aids for the elementary science teacher are presented in each issue. It is free and a "must" for science teachers.

6. Price, Betty. Adventuring in Nature, New York, National Recreation Association, 1939. 96 p.

   Adventuring in Nature is a complete treatise of nature activities with emphasis on camping and recreation for the adult. It is an excellent source for nature games, music, art, drama, and clubs. (Price 60¢).

7. Peterson, Roger T. A Field Guide to Birds, New York, Houghton Mifflin Company. (Price $3.50).

8. Church and Dwight Company, Inc. 70 Pine Street, New York, New York.

   Ask for their bird pictures sets. (Free).

9. Hillcourt, William. Field Book of Nature Activities, Putnam Sons, New York, 1950.

10. Common Forest Trees of North Carolina, Raleigh, North Carolina. Department of Conservation and Development, 1944. 88 p.

    This pamphlet is free and should be on the desk of all science teachers in North Carolina.

11. Donat, Win. Our Wildlife and Its Wise Use, Raleigh, North Carolina. Wildlife Resource Commission.

    The North Carolina Wildlife Commission will furnish consultants, films, charts, and various pamphlets on request. This service is free.

12. National Education Association, American Association of School Administrators. Conservation Education In American Schools. 29th Yearbook, Washington, D. C. The Association, 1951. 527 p.

APPENDIX F

AUDIO VISUAL MATERIALS

The materials listed indicate the grade levels, length of film, producer, black and white or color. No attempt is made to describe the film content. Producers' catalogs are available and the teacher must first preview the films and audition the transcription before using them in the classroom. The audio-visual materials listed have been evaluated by teachers for use in the preparation or follow-up activities of the nature trail.

I. 16 MM Sound Films*

1.	Ants	EBF 1r BWI
2.	Autumn On the Farm	EBF 1r CPI
3.	Birds in Winter	Coronet 1r CPI
4.	Birds Of The Countryside	Coronet 1r CPI
5.	Birds Of the Dooryard	Coronet 1r CPI

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*Key

EBF - Encyclopedia Britannica Films, Wilmette, Illinois.
Coronet - Coronet Films, Inc., Chicago, Illinois.
US - United States Agriculture Department
CW - Churchill-Wexler, Hollywood, California.
YA - Young America Films, New York City, New York.
1r - One reel, eleven minutes.
BW - Black and White
C - Color
P - Primary (grades 1, 2, and 3)
I - Intermediate level (grades 4, 5, and 6)

6.	Birds of the Woodlands	Coronet 1r CPI
7.	Butterflies	EBF 1r BWI
8.	Camouflage in Nature Through Form And Color	Coronet 1r CPI
9.	Camouflage in Nature Through Form And Pattern Matching	Coronet 1r CPI
10.	Common Animals of the Woods	EBF 1r BWI
11.	Everyman's Empire	US 1r CI
12.	Five Colorful Birds	Coronet 1r CPI
13.	Fungus Plants	EBF 1r BWI
14.	Gray Squirrel	EBF 1r BWP
15.	Honey Bee	EBF 1r BWP
16.	How Animals Defend Themselves	YA 1r BWPI
17.	How Animals Eat	YA 1r BWPI
18.	How Animals Move	EBF 1r BWI
19.	Leaves	EBF 1r BWI
20.	Life Cycle of Mosquito	EBF 1r BWI
21.	Life in a Pond	EBF 1r BWI
22.	Life in an Aquarium	EBF 1r BWI
23.	Moths	EBF 1r BWI
24.	Our Animal Neighbors	Coronet 1r BWI
25.	Red-Winged Blackbird	Coronet 1r BWI
26.	Ruby-Throated Hummingbird	Coronet 1r CPI
27.	Robin Redbreast	EBF 1r BWPI
28.	Seasonal Changes in Trees	Coronet 1r CPI
29.	Seed Dispersal	EBF 1r BWI
30.	Snapping Turtle	Coronet 1r CPI

31. Snakes	Coronet 1r CPI
32. Spiders	EBF 1r BWI
33. Spring on the Farm	EBF 1r CPI
34. Summer on the Farm	EBF 1r CPI
35. Thrushes and Relatives	EBF 1r BWPI
36. Timber and Totem Poles	US 1r CPI
37. Winter on the Farm	EBF 1r CPI
38. Wonders in a Country Stream	CW 1r CPI
39. Wonders in Your Own Backyard	CW 1r CPI
40. Work of Running Water	EBF 1r BWI
41. Yours is the Land	EBF 2r CI

II. Filmstrips*

1.	Animals to Know	RP BWP
2.	Balance Among Living Things	SVE BWI
3.	Bird Nests	SVE BWI
4.	Butterflies	Stillfilms CPI
5.	Common Animals of Woods	EBF BWI
6.	Ferns and Horsetails	SVE BWI
7.	Fresh Water Shellfish	JH CI
8.	Fresh Water Turtles	JH CI
9.	Frogs, Toads, and Salamanders	JH CI
10.	Gray Squirrel	EBF BWPI
11.	Growing of the Butterfly	SVE BWI
12.	Growing Up of the Toad	SVE BWI
13.	Helping the Birds	JH BWI
14.	Home For Water Plants	JH CI
15.	How Animals Are Protected	SVE BWI

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*Key

RP - Row, Peterson Company
Stillfilms - Stillfilm Inc., Hollywood, California
SVE - Society For Study of Visual Education
EBF - Encyclopedia Britannica Films
JH - Jam Handy
Singer - L. W. Singer Company
U. S. - United States Department of Agriculture
YA - Young America
BW - Black and White
C - Color
P - Primary (grades 1, 2, and 3)
I - Intermediate (grades 4, 5, and 6)

16.	How Animals Get Air	SVE BWI
17.	How Animals Protect Themselves	SVE BWI
18.	How Some Animals Get Food	SVE BWI
19.	How Birds Serve Man	JH BWI
20.	How Rocks Are Formed	SVE BWI
21.	How Things in the World Change	SVE BWI
22.	How Young Birds Get Food	JH BWI
23.	Insect Pests	SVE BWI
24.	Insects - Beetles, Butterflies and Moths	SVE BWI
25.	Insects - Transformations	SVE BWI
26.	Life in Ponds	JH CI
27.	Life of the Swallowtail Butterfly	SVE BWI
28.	Living Things	Singer CPI
29.	Moths	SVE BWI
30.	Mushrooms	SVE BWI
31.	Nature Pets	SVE BWI
32.	Our Earth is Changing	SVE BWI
33.	Parts of a Flowering Plant	SVE BWI
34.	Saving the Soil	SVE BWI
35.	Small Fresh Water Animals	JH CI
36.	Soil	SVE BWI
37.	Some Insect Life Histories	SVE BWI
38.	Some Nesting Birds	SVE BWPI
39.	Some Spiders	SVE BWPI
40.	Some Squirrels	SVE BWPI

41. Some Wild Flowers — SVE BWPI

42. Spiders — SVE BWPI

43. Story of Earth We Find in Rocks — SVE BWPI

44. Structure of Birds — JH BWI

45. Summer Wild Flowers — SVE BWPI

46. Telling Trees Apart — RP CPI

SLIDES - 2 x 2

47. Snakes and a Turtle — SVE CPI

48. Soil, Conservation Service — US CI

49. Birds in Color (Set 1-8) — YA CPI

50. Pictures of Animals — SVE CPI

51. Pictures of Birds — SVE CPI

52. Pictures of Insects — SVE CPI

III. Records

1. American Bird Songs. 72 songs on 6 double disc records (78 rpm). Recorded by Albert R. Brand Bird Song Foundation, Laboratory of Ornithology, Cornell University, Comstock Publishing Company. Ithaca, New York.

2. The Silent Siren. A series of 13 radio programs produced by the Communication Center, University of North Carolina and cooperating state agencies. Material is available in 78 rpm or $33\frac{1}{3}$ transcription discs. Program sponsored by the Department of Conservation and Development are of special interest to this study.

IV. Transcriptions

Transcriptions suitable for broadcast purposes may be obtained from the U. S. Office of Education, Script and Transcription Exchange, Washington, D. C. The programs are produced by the Department of Interior and the Agriculture Department. Transcriptions require playback equipment having a turntable speed of $33\frac{1}{3}$ rpm.

A. Life For Wildlife Series. Twelve fifteen-minute programs produced by the United States Department of Interior in cooperation with the Wildlife Management Institute.

B. This Land We Defend. Ten programs. Running time fifteen minutes. Produced by the Soil Conservation Service.

C. Bill Scott - Forest Ranger. Twelve programs of fifteen minutes each. Produced by the New York City Board of Education and the Forest Service.

D. Man is a Giant. A half-hour program on Boulder Dam. Produced by the Department of Interior.

V. Audio-Visual Source Materials

A. Directories and Guides.

1. Baxhurst, Effie G. Conservation Films in Elementary Schools. Bulletin Number 4. Washington, D. C.: U. S. Office of Education, Federal Security Agency, 1941. 38 p. 10¢.

2. Broderich, Gertrude G. Catalog of Radio Recordings. Washington, D. C.: U. S. Office of Education, Federal Security Agency, undated. 61 p. Free.

3. Cooke, Dorothy E., and Holden, Katherine M., compilers. Education Film Guide. Ninth Edition. New York: H. W. Wilson Company, 1950. (Compiled annually).

4. Cooke, Dorothy E., and Holden, Katherine M., compilers. Educational Filmstrip Guide. New York: H. W. Wilson Company, 1950. (Compiled annually).

5. Education Screen Compiler. The Blue Book of Films. Chicago. Educational Screen, 1951. (Compiled annually).

A compilation of all 16 mm instructional and entertainment films.

6. Horkheimer, Mary F., and Diffor, John W., compilers. Education Guide to Free Films and Educational Guide to free filmstrips. Randolph, Wisconsin: Educators Progress Service, 1951. $5.00.

A listing of all sponsored films and filmstrips by titles and subjects with a brief description and loan terms.

7. Library of Congress, Motion Picture Division, compiler. Guide to United States Government Motion Pictures. Washington, D. C.: Superintendent of Documents, Government Printing Office, 1950, 208 p. 50¢.

8. North Carolina Department of Conservation and Development, Raleigh, North Carolina.

   Two conservation films are being produced by the Resource-Use Education and the Wildlife Division with emphasis on forest, soil and wildlife of North Carolina. The films will be released during 1951. Titles have not been selected. Write Dr. Richard Weaver, Program Director, Resource-Use Education, State Department of Public Instruction, Raleigh, North Carolina for further information.

B. Audio-Visual Magazines.

1. The Audio-Visual Guide, published by Education and Recreational Guides, Inc., Newark, New Jersey.

2. The Educational Screen, published by The Educational Screen, Inc., Chicago, Illinois.

3. See and Hear, published by See and Hear, Inc., Chicago, Illinois.

A listing of all sponsored films and filmstrips by titles and subjects with a brief description and loan terms.

7. Library of Congress, Motion Picture Division, compiler. Guide to United States Government Motion Pictures. Washington, D. C.: Superintendent of Documents, Government Printing Office, 1950, 208 p. 50¢.

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B. Audio-Visual Magazines.

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2. The Educational Screen, published by The Educational Screen, Inc., Chicago, Illinois.

3. See and Hear, published by See and Hear, Inc., Chicago, Illinois.


7
Come!
Look!
See the tadpoles
8
See
the Spider
Oh! Oh! Oh!
9
Lets go
to eat.
10
Oh!
A Wiener Roast
11
We like
12


We like
We go
Here
back
to school
See
the great big
trees